MEDICAL COMMUNICATIONS

OF THE

MASSACHUSETTS MEDICAL SOCIETY.

WITH AN APPENDIX,

CONTAINING THE PROCEEDINGS OF THE COUNCILLORS AND OF THE SOCIETY.

VOLUME XIII.

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Medical

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1881	Bailey, Charles Hardy . .	South Gardner.
1882	Baker, Harry Beecher . .	Dighton.
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1881	Nelson, Samuel Newell	Cambridgeport.
1882	Newell, Otis Kimball	Boston.
1881	Noyes, Ernest Henry	Boston.
1882	Palmer, Lewis Merritt	South Framingham.
1881	Perkins, Henry Phelps	Lowell.
1881	Prior, Charles Edwin	Melrose.
1882	Quimby, Sumner Ferdinand	Gloucester.
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1882	Warren, Joseph Whitehead	Boston.

1882	West, George Webb . . .	Boston.
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1881	White, Andrew Marion William	Fall River.
1882	White, Herbert Warren . .	Roxbury.
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1882	Williams, Joseph . . .	Charlestown.
1882	Wood, Henry Austin . .	Boston.
1881	Woodruff, Morgan Lewis . .	Pittsfield.
1882	Woods, Jonathan Henry . .	Barre.
1882	Woodward, Lemuel Fox . .	Boston.
1881	Wooldridge, Charles William .	Ionia, Mich.
1882	Young, John Francis . .	South Boston.

Also, the following, elected to Honorary Membership:

1882	Paget, James	London, England.

List of Deceased Fellows.

Admitted.	Name.	Residence.	Date of Death.	Age.
1841	Bacon, John	Boston	Nov. 28, 1881	64
1875	Blair, Harvey Lester	Becket	Apr. 25, 1881	29
1872	Buttrick, Abner Wheeler	Lowell	Mar. 27, 1882	39
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1846	Kelley, Elbridge Gerry	London, England	Sept. 13, 1881	68
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1837	Phillips, Henry Paddleford	North Adams	Nov. 24, 1881	74
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1823	Reynolds, Edward	Boston	Dec. 25, 1881	83
1870	Shurtleff, Herbert	Campello	Mar. 31, 1882	35
1866	Smith, Isaac, Jr.	Fall River	Jan. 20, 1882	40
1846	Stacy, Horace	Boston	May 5, 1882	68
1836	Stearns, George	Groton	Mar. 7, 1882	79
1881	Thomas, John Glover	Worcester	Nov. 29, 1881	35
1838	Tucker, Joshua	Boston	Nov. 7, 1881	81
1861	*Valerj, Gaetano	Rome, Italy	Feb. 12, 1881	64
1841	Wheeler, Edw. Marshall	Spencer	Nov. 13, 1881	70
1852	Whitney, Allston Waldo	West Newton	Nov. 11, 1881	52
1860	*Wood, James Rushmore	New York, N. Y.	May 4, 1882	70

* Honorary.

The following have been restored to fellowship:

1881 Charles Abraham Burnham, of Boston.
1882 Adoniram Judson Gray, of Cheyenne, Wyoming.

The following have been expelled:

Frederick F. Moore, of New York, N. Y.
Rufus K. Noyes, of Lynn.

The following have been allowed to resign:

John W. Brannan, of Colorado.
Joseph W. Clift, of Washington, D. C.
Edgar L. Draper, of Holyoke.
Almon D. Gay, of Warren.
Lewis W. Loring, of Boston.
Henry Tuck, of New York, N. Y.

The following have been dropped from the roll on account of removal from the State:

Herbert C. Belden, of East Granby, Conn.
George J. Bull, of Colorado Springs, Col.
Samuel W. French, of Milwaukee, Wis.
Walter H. Holmes, of Waterbury, Conn.
Charles W. Parsons, of Santa-Barbara, Cal.
John B. Wheeler, of Burlington, Vt.

The following have become retired members:

William M. Bass, of Sandwich.
John M. Brewster, of Pittsfield.
William J. Currier, of Lexington.
Nathan French, of Malden.
John Hooker, of Springfield.
John B. King, of Nantucket.
Joseph D. Mansfield, of Wakefield.
Levi Pillsbury, of Fitchburg.
Josiah Trow, of Buckland.
Thomas Womersley, of Greenfield.
Aaron Young, of Boston.

ARTICLE I.

INFANTILE MORTALITY: ITS CAUSES AND PREVENTION.

BY JAMES P. LYNDE, M.D.,
OF ATHOL.

READ AT THE ANNUAL MEETING, JUNE 14, 1882.*

MR. PRESIDENT AND FELLOWS
OF THE MASSACHUSETTS MEDICAL SOCIETY:—

THE 39th Registration Report of Massachusetts is a valuable record of vital statistics, useful and interesting to the physician, the sanitarian and political economist.

From its carefully prepared tables, we learn the relative mortality of the different diseases, as influenced by age and sex, that prevail among our people, and are enabled to study those that are wholly or in part preventable, that we may check their ravages and promote the public health.

We find that, in the year 1880, our population was 1,783,085. The number of deaths was 35,292, of which "consumption, as in previous years, heads the list," with a mortality of 5,494.

* At an Adjourned Meeting of the Mass. Medical Society, held Oct. 3, 1860, it was

Resolved, "That the Massachusetts Medical Society hereby declares that it does not consider itself as having endorsed or censured the opinions in former published Annual Discourses, nor will it hold itself responsible for any opinions or sentiments advanced in any future similar discourses."

Resolved, "That the Committee on Publications be directed to print a statement to that effect at the commencement of each Annual Discourse which may hereafter be published."

We also find that there were born alive during the year, 44,217 children. Of these, 7,190 died during the first year of life; 2,281, the second year; 1,250, the third; 857, the fourth; 635, the fifth: a total of 12,213 children who died under five years of age; 1,463 died between five and ten, and 611 from ten to fifteen,—showing, that with increasing bodily development, there is decreasing mortality, and that the age of infancy is the most perilous period of life. The deaths of the first year are 16.26 per cent. of the births, and 20.04 per cent. of the deaths. The deaths under five are 34.60 per cent., or a little more than one-third of the deaths.

This valuable registration report in its record of mortality, from "twelve of the most prominent causes in 1880," credits consumption with 5,494, pneumonia with 3,076, cholera infantum with 2,118, victims.

When we consider that cholera infantum is a disease that occurs usually in the first year of life, among infants artificially nourished, and that consumption and pneumonia occur during almost the whole remaining period, grouping about certain ages more than others, it is evident that the deaths from cholera infantum, and the diseases of infancy and childhood, are the most suggestive and important on the list of vital statistics.

It is also very evident that the infant at birth, and for a long time after, is weak, feeble, immature, imperfectly developed, unable to bear successfully the vicissitudes of climate, resist morbific influ-

ences, and maintain its hold on life against adverse circumstances and the ignorance and inexperience of those entrusted with its care; and we are not surprised to find this period of life attended with excessive mortality, some of the causes of which, and its prevention, claim our consideration.

I.—Among these causes are pre-natal hereditary influences, and inherited tendencies to certain forms of disease, like scrofulous and syphilitic affections, in their many varied forms, and congenital disturbances of fœtal growth, often caused by perturbating influences, affecting powerfully the nervous system of the pregnant woman. These causes cannot be avoided, they are beyond the control of the physician. We can advise the expectant mother to live prudently, to avoid undue emotional excitement, preserve self-control, and maintain a serene, cheerful, happy state of mind and disposition. We can advise the unhealthy mother to raise the child with artificial food, and perhaps do something by medication to modify morbid constitutional tendencies, and thus preserve life. The number of still-born premature deaths for 1880, was 1,297.

II.—Another important cause is the prevalence of acute infectious diseases, which are often severe and deadly. The most loathsome of these, smallpox, may be fully prevented by vaccination; and may we not confidently hope, that by improved methods of treatment, either preventive or special,

scarlatina and diphtheria will be robbed of their terrors, and cheated of their victims. The deaths from this cause under five, in 1880, were 1,909.

III.—Another cause of this mortality is the severe acute inflammations, such as pneumonia, meningitis, and others; too often caused by exposure of the child, insufficiently clothed, to severe climatic influences, in accordance with the popular idea that such treatment makes a child tough, hardy and vigorous: a most mischievous notion, as only the most robust can survive such treatment. Ignorance and carelessness have much to do with this cause of mortality, which in children under five, in 1880, amounted to 2,269.

IV.—Another cause is the great anatomical and physiological crisis of infancy, dentition, which with many children is attended with slight disturbance of the general health or nervous system; but when we consider the active nutritive processes going on in the growing teeth, and dental follicles, the hyperæmia, and turgescence of the surrounding tissues, the intense excitement of the local nerves, we are not surprised when this physiological process passes the bounds of healthy action, and through disturbed innervations, causes functional and pathological changes in distant organs, requiring watchful care and judicious treatment on our part to overcome. Dentition is rarely dangerous, unless associated with other disturbing influences. It is therefore important that all mor-

bid conditions due to other causes should be carefully investigated, or our treatment will be empirical, irrational and unsatisfactory.

V.—Infantile mortality is often increased by the unhealthy hygienic influences to which many children are subjected, such as breathing impure air; by living in small, close, dark, sunless, overcrowded, ill-ventilated rooms; exposure to cold; heat, filth, want of proper care and clothing, impure water, and unsuitable food. Mortality from other causes is greatly increased by these insanitary conditions, which are attributable in a large measure to parental negligence and ignorance, which can only be overcome by carefully instructing the people, and stimulating their moral sensibilities; a work which requires time and patient effort, but sure in the distant future to be accomplished. A large share of this responsibility rests upon our profession, and we should improve every suitable occasion to instruct, advise, admonish and warn the people. The perfect sanitary house and home has not yet been built and established by man! It is only to be secured in the mansions of the ideal, heavenly hereafter!

VI.—The influence of intense solar heat upon the mortality of infant life, is well known, and so important that we cannot neglect its consideration. If we again consult the valuable Registration Report, we shall find that July, August and September, the hot months of the year, are peculiarly

fatal to infants, by the prevalence of diseases of the central nervous system and digestive organs, such as convulsions and cephalitis, diarrhœa, dysentery, and cholera infantum. To a certain degree, peculiar to each department of organic life, solar heat is an essential stimulant and excitant to all the processes of growth and nutrition. Above and below certain ranges of temperature, all forms of life are impossible. Our human life is a mystery, so is every manifestation of the life force, in every aspect of investigation. Next to the mystery of thought, is the mystery of animal heat; constant in man, in health, under all external conditions, at about 98.4° of Fahrenheit's scale. A few degrees above this point is speedily fatal, through change in the soluble albuminoid constituents of the tissues, arresting muscular contraction, circulation and respiration. The influence of solar heat upon human life cannot be studied, except in connection with many other coincident conditions, which modify its effects, such as the moisture of the air, atmospheric currents, electric and magnetic influences, the state of the bodily functions, the supply of food and drink, clothing and exercise. Cases of insolatio afford examples of its depressing influence and deadly power. The functions of perspiration and renal secretion are checked or arrested, and a condition closely resembling that of uræmic poisoning is established; attended with convulsions, and congestions of the brain, lungs, and internal organs, great depression of the nervous system, a rapid

rise of bodily temperature, and speedy death. The most important physical property of heat is its power to expand minerals, gases and almost all substances subjected to its influence. It rarefies the air, so that the important function of respiration is imperfectly performed, less oxygen is inhaled, and the exhalation of carbonic acid is diminished. The gases contained in the tissues are expanded, the circulation is enfeebled, the secretions are checked, and the functions of the nerve centres which regulate circulation, respiration and nutrition, maintain physical vigor, resist disease, and preserve the integrity of the organization, are greatly depressed, especially in delicate, ill-nourished, poorly fed infants, living under unfavorable hygienic influences. The indirect effect of radiant heat on the health of children and older persons is important, through its power to excite and quicken the processes of fermentation and putrefaction, in foods of a perishable nature, such as eggs, milk, fresh meat, fish, bread, fresh vegetables, and fruits, rendering them unfit for consumption, causing gastric and bowel derangements, that may be severe and fatal. To overcome this powerful cause of infantile mortality, it is important that the child should be kept quiet at home in the largest, coolest room in the house, supplied with light clothing, frequent cool baths, fresh air, and pure water. If necessary, cool the air of the room by keeping ice in a tub, or by hanging a wet sheet near inflowing currents of air. The refrigerator is an indispensable

luxury and necessity with the rich. An abundant supply of ice for the poor, in hot weather, would favorably affect the mortality of infants, and greatly increase the comfort, health and happiness of such people.

VII. We will now consider the most important of all causes of infantile mortality : the use of improper, indigestible articles of food—the prolific cause of gastric disturbance, diarrhœa, colitis, cholera infantum, and starvation. Milk has been divinely ordered, as the only proper food for the young of all classes of mammalia; and Nature has made provision for a bountiful supply. Milk is an animal food, composed of several elements in variable proportionate quantities, in a state of emulsion, each of which is essential to the growth and nutrition, and no one that is superfluous to the necessities of the young mammal or human infant. In ordinary normal conditions, this fluid is abundantly and perfectly prepared in the mammary glands of the mother, and when properly administered fully meets the wants of the young child for both food and drink. Therefore it is a mother's most imperative duty to nurse her child, if possible, until several teeth appear, when it will desire, and be able to digest, animal and farinaceous food, and may be safely weaned.* The health and

* The changes in the physical organization of our American women, growing out of our high pressure civilization affecting their fecundity, and their ability to properly perform the functions and duties of maternity, especially in nursing, have been ably discussed in the annual discourse for 1874, by Nathan Allen, M.D., LL.D., of Lowell, and the reader is advised to review that address in this connection.

comfort of a child is greatly promoted by regular feeding, once in two hours and a half in the day time, and twice in the night, and at longer intervals with increasing age.

We are often called to prescribe for children made sick by irregular nursing, every time they wake or worry, who have been dosed with Mrs. Winslow's infernal syrup of morphine, and the whole list of domestic remedies, and now comes the doctor, who will be expected to lance its gums, administer alteratives, laxatives, alkalies, astringents, tonics, stimulants, digestives, and more opium, which he may do, only to be disappointed, unless he can persuade the mother to properly administer its food. Succeeding in this, the child will recover without medicine, and he can cure it in no other manner.

Again, to keep a child in a growing, healthy condition requires tact and judgment in its general management. The good physician will often remind mothers and nurses of the importance of pure air, sunlight, suitable clothing, and cleanliness. He will advise the mother to avoid visiting and travelling in the hot months, and keep the child quiet and cool at home, and offer it, frequently, cold water to relieve its physiological demand for fluids, and prevent it from overloading its stomach in nursing. He will advise frequent bathing to soothe, invigorate and refresh its nerves. He will secure for it a good bed, at least when sick, and not allow it to be packed into a deep wooden box on rockers, with a rubber blanket

or an old soiled comfortable to lie upon, with its head buried in a soft, hot feather pillow. A good-sized crib, with a hair mattress, or a sack filled with clean oat straw, covered with a folded sheet, makes a good bed, especially in warm weather.

The good doctor will administer but little medicine for the disturbances incident to the process of dentition, for the child will not be well in hot weather, especially in the second summer, except under most favorable circumstances, until the teeth emerge, or the autumnal frosts appear, making the air more bracing and invigorating, when diarrhœal disorders will speedily disappear.

Attention to these and many other seemingly unimportant, trifling matters, secures good care, and good care is no trifle. It is indispensable, if we would promote the health and comfort of our infants, and prevent this excessive mortality.

Circumstances may prevent the nursing of the child, from its birth, or we may be obliged to wean sooner than is desirable ; a wet nurse cannot be obtained, and artificial food must be provided. How shall this be secured ?

The prevailing custom with physicians and nurses, is to use cow's milk diluted with one, two or three parts of water, with the addition of a little salt and sugar. Some prefer milk, water, and cream, in variable proportions, or the use of some one of the many patent commercial foods that have recently been invented. Others rely upon thin gruels of arrow-root, corn-starch, gelatine, barley, oat-meal, or wheat, either pure or enriched

with milk. Such methods of artificial alimentation are recommended in all standard works on medicine, and by almost all teachers.

The books abound with learned arguments to prove that it is dangerous to administer undiluted cow's milk to an infant; and minute directions are given, how to dilute, adulterate, and render it more acceptable and safe.

The chemist has been asked to determine, by the methods of his subtle art, the constituent elements, and the difference between human and cow's milk; and he finds proportionally more sugar in human, and more casein in cow's milk, with less important variation in the fatty, saline, and animal elements. He also finds that the casein of human and that of cow's milk differs in its physical characteristics when acted upon by reagents; that of the cow forming a more tough, firm, indigestible curd.

Different analyses give variable results in all particulars, as might be expected; for it is apparent that the composition of any milk, human or animal, will be modified by the season of the year, the quality of the food and drink, the state of health, the time since parturition, individual and race peculiarities, and many other influences. Again, milk has certain volatile elements, and it may be polluted with septic germs, or the infection agent of severe or deadly disease, which no art of the chemist can detect. So that whatever may be the results of analysis showing differences in the grosser constituents, they are not of suffi-

cient practical importance from which to deduce the conclusion that it is dangerous to feed infants with undiluted cow's milk, and that they cannot be safely and successfully raised in this manner.

The power of the chemist ends with his destructive analysis. He can neither mix nor distil any fluid having the nature and physical characteristics of milk. The female is the only chemist who can prepare this invaluable food; elaborating it through processes secluded from observation, in the laboratory of her mammary gland.

The artificial substitutes for human milk that have been mentioned have certainly been most thoroughly tried for many years, and the results have not been very flattering to the scientific acumen of the inventors. Thousands of helpless, beautiful children have been yearly starved to death, poisoned and made sick, by the use of these unsuitable, indigestible foods.

A consideration of some of the anatomical and physiological peculiarities of the digestive organs in infancy, will aid us in the further discussion of this subject; for the scientific successful method of artificial alimentation must be in harmony with the facts of anatomy and physiology, and not rest on any other basis or theory, however endorsed by eminent fathers in medicine.

At birth the child has no visible teeth. The salivary glands are small, weighing, as stated by the Drs. Jacobi of New York, "at the age of one month, 34 grains; at fifteen months, 80 grains; at two years, 180 grains."

Their physiological function is the secretion of an alkaline lubricating fluid for assistance in deglutition, having power to convert amylaceous foods into grape sugar, or dextrose. These glands are so small at birth, and until the fourth or fifth month, that but little saliva can be secreted. After this age, while teething, it is often excessive.

The stomach is a simple dilatation of the alimentary canal, the curvatures of after life being absent. It easily rejects its surplus contents when overloaded, and saves the child from distress and sickness.

Its physiological function is the digestion of albuminoid or proteid foods, by the solvent power of its secretions. Sugar, starch, and oil, are not digested in the stomach. They pass into the duodenum with the chyme, and are digested by the secretions of the liver, pancreas and intestinal glands.

In this connection we must mention the important anatomical fact, as stated by the Doctors Jacobi, "that the pancreas varies in weight in infants of the same age; that in infants under four months it is often less than a dram, never weighing two drams." If these are unquestioned facts, it is clearly evident that the infant has but feeble power to digest the starchy elements of farinaceous foods; and that decoctions or gruels, made from wheat, oats, barley, corn-starch, arrowroot and rice, which contain from sixty to eighty-six per cent. of starch, and are the basis of all commercial infant foods, should have a low place

in an infant's diet, compared with cow's milk, which contains no starch, but has an abundance of all needed elements, and is almost perfectly adapted to the digestive organs of the child, the trouble being with the quality of the casein, and the liability to be acid instead of alkaline like human milk.

"The investigations of Guillot into the change underwent by the food given to children in French hospitals, and the great mortality attending those who were fed on farinaceous and starchy substances boiled in water," is confirmatory on this point. "He found uniformly present in the bowels a jelly-like substance, which on analysis was found to be nearly pure starch." The children were starved to death.

If with care in the selection, management and feeding of the cow, we can modify the milk product, and secure a food almost identical with, yes, infinitely nearer human milk than any artificial mixture can be, and if by some method of administration we can render it acceptable to the stomach, overcoming objections, by good practical results, all of which we declare can be accomplished, ought we not, considering the enormous death rates attending old methods, to take a new departure, and establish our practice on the only sound basis, the facts of anatomy and physiology? We can lose nothing in reputation. A larger mortality cannot be easily secured and placed to our credit!

Let then the physician and the physiological

chemist, in dealing with this important matter, consult the great high priest of nature, the farmer, and by his aid, using the chemistry of nature, secure an abundance of perfect natural food for our children—pure, sweet, rich cow's milk.

All theories and methods of administration, to be accepted as fixed, must successfully stand the great crucial test of science, that of observation and experience. What testimony then can we secure from observation and experience ?

In 1868, Dr. Stephen Rodgers, of New York, published an article in the *Medical Record* recommending undiluted cow's milk for infants, after nine years' experience, and its use in bringing up three of his own children.

Dr. Hiram Corson, in an address before the State Medical Society of Pennsylvania, on food for infants, some fifteen years ago, after observations extending over a period of more than thirty years, declares : "I feel quite certain that it is almost as easy to raise children by hand, if they have an abundant supply of good, undiluted cow's milk, as it is by the breast."

His experience confirms his opinion "that thousands of children who die annually of diarrhœal diseases, die for want of food. They are really starved to death." He says to the profession, "and we are not blameless."

Dr. Austin Flint, in his work on the Practice of Medicine, article Cholera Infantum, page 417, says : "There is reason to believe that infantile mortality in cities is attributable in no small meas-

ure to the use of diluted, sophisticated, artificial milk. The importance of undiluted milk from a pure source, to the welfare of children, is far from being generally appreciated."

It was with great pleasure that I found, while preparing for this occasion, in the last, the April number of the *American Journal of Obstetrics*, a "special report of the discussion, on the question of nourishment, in the pediatric section of the fifty-fourth meeting of German naturalists and physicians, at Salsburg, Sept. 19, 1881."

A commission had been previously appointed to prepare papers and investigate this important subject. A circular was prepared and widely distributed, directing the discussion to two points:

"First—Substitution of natural, unadulterated animal (cow's) milk for human milk, and its production."

"Second—Substitution of artificial foods, with or without milk, for the natural milk; their nature and value."

After earnest discussion for two days, the conclusions reached in regard to artificial foods, were expressed by Dr. Soltmann, as follows: "Now and evermore it is unanimously agreed, that these preparations *can in no way be substituted for mother's milk, and, as exclusive foods during the first year, are to be entirely and completely rejected.*"

In regard to cow's milk he said: "Therefore we now stand at this point: cow's milk is the only substitute for mother's milk. Our whole endeavor

must be to procure and use this in the best way. This standpoint is a long step in advance on the broad field of work before us." As presiding officer, he closed the discussion thus: "Let us hold fast, gentlemen, to what we have already gained. Let us attempt in the future to put it in the power of even the poorest to obtain good, pure milk for his children. United work on the part of doctor, experimental pathologist, physiological chemist, and land-owner, can alone fill up the gaps in our knowledge of dietetics."

For thirteen years, when for any cause it has been necessary to resort to other food than mother's milk, and the fears of mothers and nurses could be overcome, I have used undiluted cow's milk, and failed only in three instances to raise the child.

One was born in midsummer; the mother had no milk. The parents had previously raised a child with pure milk. They attempted to raise this with farrow cow's milk, which was unsuitable ; vomiting and purging did its work in a few days. A midwife attended at its birth. I saw it once the day before it died. It was not fairly under my care.

Another was born April 22, 1874. The mother had convulsions, was delivered with forceps. The child was partially nursed for three weeks, and then weaned with undiluted milk. It was very feeble from birth, but did well for nearly three months; July 27 it died, after a week's ill-

ness caused by fevered, bloody milk, which was not detected until the child was made sick. The cow was injured in the pasture, and the unhealthy putrid milk poisoned and killed the baby.

The third case occurred in August, 1881. The mother was confined while suffering from a severe attack of acute dysentery. She died in seven days. The child was sick from birth, its body emitting a sour, urinous, sickening odor, like that from the mother during her sickness. It lived twenty-four days.

A brief recital of a few severe test cases, to illustrate the views here presented, is important.

CASE I.—June 27, 1869, a daughter was born to Dwight E. Clement, of North Orange; nursed a month, to July 30th, when the mother was prostrated with a severe typhoid fever. The milk "dried up," and grandmother fearing "clear milk would kill the child," gave it one-fourth milk with three-fourths water. This was in the hot July. In a few days the child was sick with vomiting and purging. It rapidly failed, its flesh wasted, the anterior fontanelle was depressed. It uttered the peculiar plaintive moan we have all too often heard in similar cases. The hands dropped lifeless; the tongue lay on the floor of the open mouth; eyes half open; extremities cold; death imminent. Grandmother was ready to try anything. Undiluted milk was carefully administered.

The child is now a fine, healthy girl, thirteen years of age. This was my first case; it gave me confidence and courage.

Case II.—Sept. 2, 1872, a son was born to Hollon Farr, of Athol. It never nursed, and was fed on milk and water, and Graham gruel and milk until it was nine months old, when it was prostrated with vomiting and purging. Clear milk was advised; and the boy is to-day a fine, healthy fellow, nine years old.

Oct. 10, 1875, another son was born. The mother had no milk. When the yellow bile appeared in the discharges, undiluted milk was given, and the nurse, who was very timid, was instructed to let it have all it would take, after giving it a little cold water. I was called in two weeks. The child did not thrive; it worried, was weak and feeble, with a peculiar red blush on the skin. The nurse had left, and the mother said she had given it only a great spoonful of milk at a time. It was starved. We advised the mother, and the child soon had all it wanted, and is to-day a fine, healthy boy, six years old.

Now mark this: four out of six of their children died in infancy, of cholera infantum, fed on milk and water and farinaceous gruels and milk, before I became acquainted with the family.

Case III.—July 23, 1876. A son was born to A. M. Sawyer, of Athol, after a hard labor, terminated with forceps; weight, twelve pounds. Nine hours after, the mother suddenly died. The child never nursed. It was fed with water and a little milk for two days, until the yellow bile appeared in the discharges and appetite was manifested, and the nurse was instructed to give it un-

diluted milk. Three weeks after, August 14, I was called. It was vomiting and purging. The nurse, a good one, the same as employed by Mr. Farr, was timid and had added one-fourth water. The child was cheated twice, first by the milkman, who supplied the milk from that of several cows mixed, instead of from one as he had agreed to do, and that was evidently extended with water. Second, the nurse added more water. Milk was obtained twice a day from a young healthy cow that had recently calved. It was carefully fed pure, a little medicine and brandy administered, and we had no further trouble. It is now six years old.

A child of E. A. Thomas was brought up on milk from the same cow at the same time.

CASE IV.—May 2, 1867. A son was born to O. T. Brooks, of Athol. In six weeks the mother's milk failed from debility and "nursing sore mouth," and the child was weaned with one-third milk and two-thirds water. As usual the food disagreed; it irritated and poisoned the child; vomiting and purging finished its work Aug. 30, and a beautiful child passed away, aged four months.

December 6, 1871. Twin boys were born. At eight weeks they were weaned for the same cause, in the same manner as before. They lived, pale, ill-nourished and weak, until August, 1873, when the inevitable "vomiting and purging" made quick work with its victims, and the two dear children were laid away, aged one year and eight months.

Oct. 26, 1875. A daughter was born. In two months was weaned, as the others were. The old enemy, vomiting and purging, tried for a few weeks to do the work which in midsummer it would quickly and easily accomplish. At length the fearful, reluctant mother consented to use undiluted milk, and in a few days the child was well, and is to-day a robust, healthy, beautiful girl, seven years old.

A son was born Aug. 3, 1879. Was weaned in hot weather on undiluted cow's milk, without trouble, and is now a tough, strong boy, nearly three years old.

I have no record of the number of cases weaned and raised on undiluted cow's milk,—probably nearly a hundred, as my obstetrical cases at full term, for the thirteen years, number 520; and I fully agree with Dr. Corson, "that it is about as easy to raise children by hand, if we have an abundant supply of good, undiluted cow's milk, as it is by the breast;" and I will further add that under these conditions I neither hesitate or fear to wean in hot weather. Success with any plan of management can only be secured by attention to a multitude of seemingly unimportant details. The child seeks the breast to satisfy its thirst and appetite, and for no other purpose. It draws the warm milk slowly, with much effort, from the mother's breast. As it reaches the palate, the gastric glands are excited, the digestive fluids are freely secreted, and mixing with the inflowing milk, exert their solvent power on the whole bulk of in-

gesta with great energy. Therefore it is good practice, especially in hot weather, to offer the child cold water before nursing, to satisfy its thirst, and prevent it from overloading its stomach.

In artificial feeding we should carefully observe the methods, and follow the indications of Nature. Therefore we would satisfy the infant's thirst, by allowing it to draw water from a tumbler slowly through the nurse tube; some children will require considerable, others but little. Not being an aliment, it does not excite the secretion of the gastric juices. Then in a few moments allow the child *all the fresh, undiluted cow's milk it will take*, warmed to the temperature of the blood, only being sure that it is slowly ingested, just as Nature supplies it when nursed from the mother's breast.

Some will ask, why not mix the water and milk in the bottle, instead of the stomach? What is the difference in result?

Milk and water is neither the one, nor the other. It is extended, adulterated, weakened milk, and when thus administered more bulk is required for a given amount of nourishment, the stomach is over distended, and the gastric juice so diluted as to weaken its digestive power; besides, the water and milk separately administered mix but little in the stomach, the water is so rapidly absorbed. By this method we do closely imitate Nature, and in a great measure, yes, almost entirely overcome the difference in quality and digestibility of the casein between human and cow's milk.

The cow should be selected with great care. Milk from different breeds, and from cows of the same breed, vary widely in their essential elements. That from the Jerseys and Aldernays is excessively rich in cream. The Ayrshire and grade cow should be preferred, as they furnish a fluid more nearly resembling human milk. A very fat baby is not to be desired. The quality of milk is influenced by the season of the year, the food, air, water and care which the cow receives, and the state of her health. For obvious reasons we would avoid a diseased, old, or farrow cow; one fed on turnips, onions, cabbage, slops, garbage, and coarse, sour, swamp grasses, supplied with water from a stagnant pool or polluted well, or kept in a damp, filthy, ill ventilated stable; and select a young, healthy Ayrshire, or grade cow, that has recently had a calf; one that has good, sweet, upland pasturage, with pure spring water to drink, and a plenty of salt; one that is sheltered in a clean, well ventilated stable; one that has good care, that is kept quiet and gentle, not worried by dogs or boys. We would examine the milk with a test tube, note its specific gravity, its color, smell and taste; the percentage of cream, its reaction to test paper, and if acid reject it. We must use our eyes, our nose, our taste, and secure pure, rich milk, milked morning and evening from a clean cow, into a clean pail; keep it in a clean bowl, covered with a clean napkin, in a clean closet, away from the pantry where food is stored. It will rapidly absorb odors, dust and septic germs,

and in hot weather will quickly ferment, putrefy and spoil, unless cared for, and thus become the vehicle, or cause of severe, or perhaps deadly disease. It is the most sensitive and easily spoiled of all animal foods.

Having secured good milk, we would procure a suitable nurse tube and bottle; one with a screw in the stopper is desirable to regulate the flow. We must be sure that the child draws the milk slowly, just as in nursing; for if poured into the stomach faster than the gastric juices can be secreted to mix with it, it may form a hard mass of curd, distress the child, and perhaps cause a convulsion.

The nurse tube and bottle should be kept scrupulously clean and sweet, by rinsing in weak soda water immediately after using. Perhaps, after all our care, the milk may not be acceptable to the delicate stomach; then render it more alkaline, by adding a suitable quantity of bi-carbonate of soda or potassa, or the phosphate of soda, or try the milk of another cow. The trouble may be due to bacteria or microdemes; then sterilize the milk as advised by Tyndall, by subjecting it to a heat of 150° for a few minutes.

I never boil milk for a child; it changes its specific gravity and other characteristics. Salt should not be forgotten.

We cannot manage all children by one precise rule. Rules and methods must be elastic, and varied to meet individual idiosyncrasies, and peculiar conditions.

That many children have been successfully raised on milk and water mixed, and other foods, we freely admit. They often look plump and well nourished, but how quickly their flesh wastes under a slight illness! Their tissues lack firmness and stamina; they lack endurance, and if much sick in hot weather are about sure to die, while breast fed and pure milk raised children bear disease and dentition equally well; cholera infantum rarely attacks them.

The Registration Reports record the fact, which is confirmed by our observation and experience, that of all the causes of infantile sickness and mortality that of defective alimentation is the most important. Diseases of the digestive organs from this cause, when intensified by other unavoidable conditions, like hereditary tendencies, dentition, and solar heat, are not readily controlled by medicine. They are best treated by prevention. The resources of preventive medicine are of incalculable value to mankind. Can the worth of vaccination be estimated, or the immortal Jenner be forgotten? The power of the great anæsthetic to prevent pain, and save life, which was first demonstrated to a startled world in yonder hospital, by skilful surgeons of the Massachusetts Medical Society, will continue to bless all future generations.

In the late war the able and energetic General Butler, aided by his medical staff, through wise measures of prevention, in transferring his command to his successor, was able to declare to the people of New Orleans that he had demonstrated

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that the yellow fever could be kept from their borders ; a peaceful victory, of more value to this country than a successful battle.

We cannot have forgotten the epidemic of small-pox that so disturbed and alarmed the people a few years ago. Boston suffered not only from the loathsome pestilence, and its mortality, but in every branch of her industry and trade. Conceited, incompetent men controlled the most important department of administration, that of the Public Health, and the disease marched on unchecked. But when intelligent, competent commissioners were appointed, and clothed with authority, one of whom was a respected Fellow of our Society, now His Honor, the mayor of this city—Dr. Samuel A. Green—the power of preventive medicine, wisely employed, checked the pestilence, the public health was restored, confidence and prosperity returned to this beautiful city, and the results were brilliant!

If that "perpetual and unrelenting scourge," typhoid fever, can be eradicated by preventive measures, as claimed by Dr. Parkes, Dr. Budd, and many English and German physicians, and, as very ably and suggestively discussed by Dr. Thomas H. Gage in this place two years ago, what a dark shadow of suffering and death would be dissipated! The comfort, happiness and security of human life would be greatly increased ; the prosperity and welfare of society immeasurably promoted, and scientific medicine would achieve imperishable laurels.

If in the department of infantile therapeutics, preventive methods can be so employed as to check the ravages of these diseases, that rob our homes of our brightest jewels, will not the results be most brilliant, and of incalculable value to society? To the accomplishment of this high purpose, the profession should direct its investigations; and although we may be modest, obscure physicians, we can aid in this work, through associated effort, in our district medical societies, by imparting to each other our opinions derived from investigation, observation and experience.

The crowning glory of our profession is its broad, practical humanity, that reaches with its ministrations the sick poor, provides care in asylums for the insane, the blind, the outcast, the inebriate, the consumptive, the feeble-minded, and even the nervous.

No adequate provisions have been made for the safety and welfare of the helpless infant. Our profession should encourage the generous philanthropy of wealthy men, like Thomas Wilson, of Baltimore, who, dying in 1879, left a bequest of $500,000 "for the purpose of securing a summer retreat for sick children, from the heat and unhealthfulness of the city." His will says: "Having observed for many years the great and alarming mortality which occurs each summer among young children, ... I do not think I can make a better use of some of the means of which God has made me steward, than in the alleviation of the pains and prolongation of the lives of these

little children." One hundred and sixty acres of land 600 feet above tide water have been secured, a half hour's ride from the city of Baltimore, and the Wilson Sanitarium started in its beneficent work, dealing only with the poorer classes, without pay.

It is pleasant to notice that in our State similar institutions are being established, though on a small scale, with insufficient equipment: one, the Seashore Home at Winthrop; another, the Children's Hospital at Baldwinville. If generous benefactions could be secured for their maintenance and extension, and the mothers among the poor of large cities, living under unfavorable sanitary conditions, could receive, with their children, assistance and care during the hot months, very much would be accomplished towards preventing this excessive infantile mortality.

May we not reasonably hope, that in the near future, some member of our Massachusetts Medical Society, having the kind heart and executive ability of our late associate, Dr. Samuel Gridley Howe, will engage in this work, and accomplish for helpless infancy, that measure of relief which he secured for the blind and feeble-minded; and that from the ranks of business, some man with princely wealth, generous, humane, philanthropic, with the heart of a George Peabody, influenced by the spirit and example of the Great Nazarene, "who took little children up in his arms, put his hands upon them, and blessed them," will establish a beneficent charity, after the example of

Thomas Wilson, that will relieve poor children in their homes by furnishing an abundant supply of pure milk, ice and other comforts, or provide for them good care in a well regulated asylum.

This subject is so important, so far reaching, so intricate a problem, so interwoven with the welfare and foundations of human society, that its discussion kindles enthusiasm, and I am reluctant to leave the duty of this hour, so partially and imperfectly performed.

Anxious fathers and mothers are seeking our aid, in our respective places of duty, to save their children from death! May we so wisely, tenderly, and successfully discharge our responsible duties, as to deserve and receive the gratitude of parental hearts, and the blessing of Almighty God!

SOME OBSCURE MENTAL SYMPTOMS OF DISEASE.

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SOME OBSCURE MENTAL SYMPTOMS OF DISEASE.

Such a considerable number of cases of disease seriously interfering with some of the functions of the mind without causing marked intellectual disorder have come lately within my observation, that I have thought it worth while to call the attention of the Society to their more important features.

A child seven years old, with the history of profound cerebral disturbance at the age of five, and right hemiplegia of short duration, was observed to have an entire change of character since that serious injury to the brain. Previous to it he had been in no way different from what might have been expected of a child of his age and circumstances. After it, the balance of the mind was found to be entirely destroyed, although the memory and perceptive faculties were observed to have become extraordinarily acute. Upon entering the room, it was impossible to arrest his attention sufficiently to get answers to questions for which he had abundant intelligence, except for a moment at a time; his eyes glanced rapidly about, and in five minutes he had taken in nearly every thing to be seen, beside prying into drawers and pockets so vigorously as to keep his mother on the alert to prevent him from injuring himself or some object in the room. His mother stated that the affectionate nature which he had before his brain disease had remained, but that, with it all, there was in him the real spirit of a

devil, which could not be corrected or chastised or drawn by loving care into anything better. He was the torment of every one who attempted to teach him, and yet he managed, by the aid of his unaided faculties, to pick up knowledge of a certain kind much faster than his companions. He not only did not possess the power of controlling his mental operations and his actions natural to a boy of his years, but he could not be, and never can be, educated into them. He is and always will remain, like a locomotive with the brakes off and steam up, off the track, as long as he lives, in spite of the best efforts of his friends and himself to the contrary. Steady application, reasonable self-control, reflection and judgment he will never have except to a limited degree, while the acuteness of his other faculties will keep him in constant danger up to the time when he follows the natural law of the unfortunates like him, to die of disease or accident, perhaps hastened by his own temerity, to commit suicide, to develop into more general mental disease, or to be convicted of crime justly or wrongly.

The second case was similar to the first except in its origin, which was congenital, the child having been born almost literally in the midst of a drunken brawl of a mother who had rarely been sober during the whole period of gestation. Its future will be similar to the other's.

It is by no means uncommon to see less marked types of this form of brain-disease in women after confinement, in young persons of families with neurotic tendencies, after typhoid fever and scarlet fever, and in old people as the result of cerebral hæmorrhage, but of so marked a degree as in the two cases which I have quoted, or sufficient to constitute a genuine type of insanity, it is so rare that even many men having had long experience in insane asylums state that they have never seen it.

The next case is one, the notes of which were given me

by Dr. S. K. Towle, whose words I cannot do better than quote, of a man whom he had under his care at the Soldiers' Home near Milwaukee, Wis., some eleven or twelve years ago.

"He had been a lieutenant in a volunteer regiment, and I gave him rather more privileges on that account, but after a time I found that he was more nearly an example of 'total depravity' than I had ever seen. There was no truth in him, and he was intelligent enough to make his lies often seem plausible to me as well as to others. By his writing and talking and conduct generally, he kept the patients and their friends in a ferment, and gave me more trouble than the whole hospital beside. For a long time I could find no evidence of any disease about him; but after long observation I thought that I got evidence of epileptic seizures in his sleep, and possibly lighter ones, *petit mal*, in the day time; and I settled down on that. As to insanity, I am sure he would have impressed a casual observer as an unusually bright and intelligent fellow, while at the same time perhaps he would be maliciously lying in every sentence.

"He had a small scar about the middle of his forehead, which he said was due to a slight flesh wound from a glancing ball in battle, and I finally thought that possibly his epilepsy might be caused from the effects of the blow from the bullet. While he was under my care an older brother came to see him, and he told me that up to the time his brother, my patient, who so tried my patience, entered the army, he was almost a model young man, amiable and affectionate, the pet of the whole family and intimate friends; 'but,' said he, 'ever since he came back he has been possessed of a devil if ever any one was.'

"After a time, much to my delight, he asked for a transfer to the Soldiers' Home at Dayton, Ohio, which I got for him with commendable alacrity, and he went there. His con-

duct at Dayton was the same as with me, but after a few months he quite suddenly died, when an autopsy was made. In sawing open the skull, at the point of the small scar on his forehead, the saw came directly upon the butt end of a conical bullet, two-thirds of which projected through the skull, piercing the membranes and into the brain. The internal table of the skull had been considerably splintered by the ball, the pieces not being entirely separated, and there was evidence of severe chronic inflammation all around, and quite a collection of pus in the brain where the ball projected into it. Here was the 'devil' that had possessed the poor fellow. Instead of being an outrageously wicked, unprincipled man, he was a martyr to the Union cause as much as Abraham Lincoln, and more, for the ball that killed my patient not only took his life but destroyed his character, lost him the love and esteem of his friends, and doomed him for half a dozen years to do the things he would most have hated and despised when he was himself. Dr. Dunlap, the assistant surgeon at Dayton, told me that he found in this man's trunk letters from several, half a dozen I think at least, women in various places, from which it appeared that he was engaged to be married to each one of them. The letters were neatly tied up in packages, each one's separately, in several instances with photographs supposed to be of the writers, and the date of reception and reply was noted on many of the letters in a business-like way."

The fourth case is of a gentleman, who without other marked mental symptoms except an unusually advanced mental deterioration for his age, 64, and yet without senile dementia, had so strong an impulse to kill two members of his household, a son whom he loved, and a mother-in-law who annoyed him in many ways, that he begged to be sent to an asylum for the safety which his family persistently refused to think necessary. In the course of six

months, with the progressive weakening of his mental faculties, his power of self-control became so much diminished that during one of his paroxysms of homicidal impulse, excited perhaps in part by irritation from a natural cause, he killed his mother-in-law, an act entirely abhorrent to his nature. He afterwards begged to be never left alone with his son for fear that he might commit some act of violence upon him. There was no delusion, no illusion, no hallucination, no mania, no melancholia, no delirium, no unconsciousness, no ignorance of the nature of his deed, no blunting of his sense of right and wrong, not the slightest moral perversion, no feeling but horror at his doing such a thing, and yet the insane impulse, as inevitable as the sword of Damocles or the dagger of Macbeth, was so strong that he could not resist it. He was *conscias sui*, but not *compos sui*. After his arrest his feeling of grief and remorse was so great, the disgrace of being hanged, which he feared, was so terrible, and his mental suffering was so indescribably intense, that he tied a handkerchief around his neck, meaning to hang himself, an entirely sane and logical process; but, in spite of his insanity, his fine character asserted itself, his ordinary self-control returned, and he said, "No, if I am to perish for my act, it shall be at the hands of the law, it must not be by my own hand; that is not right." It is not possible to find a more irresponsible act than this man's homicide, and it is not easy to conceive of more tremendous self-control as regards his own self-destruction, or more sane appreciation of his own condition and relations to society.

The cases which I have described, including that one which was complicated with senile dementia, come under the head of moral insanity, not very properly so called, because the loss of control over the operations of the mind constitutes evidence of impaired intellect and is a purely mental symptom, which under some form or other is al-

ways discoverable. There is in many cases frequent or persistent headache; in most, there are great irritability, some feature of intensely developed egoïsm, general or partial moral perversion, exaggerated or perverted sexual instinct, decided loss of the sense of the relation of the individual to the community, a striking misconception of the adjustment of means to ends, overwhelming strength of ideas and impulses as compared with power of self-control, and yet a certain fixed standard of right and wrong, together with a definite sense of duty and a power of self-control at certain times and in certain directions, which with the quickness of the perceptive faculties and memory, usually convey to those not familiar with the disease an idea of simple depravity. It differs from the eccentricity of character over which more and more control is gained with advancing age. Its diagnostic point, if there is one such, consists in the fact that like other diseases it is progressive, and that it ends as a rule in suicide, or advances slowly into mania or dementia with such gradual progress that there is no time at which a marked change in character or condition is discernible. Until mania or dementia appear, crimes are rarely committed; and the point at which accountability ends and irresponsibility begins is the most difficult problem in the whole range of the medical jurisprudence of insanity. In reported cases of recovery, I should doubt the diagnosis.

I have illustrated very briefly a type of insanity which is recognized, under one name or another, by the leading authorities in mental disease, although not fully described except in the German medical literature. It is easy, as Krafft-Ebing says, for the non-expert expert to fail of a correct appreciation of such a case. This seems to me the most terrible of all of the many forms of mental disease, as it is also the least understood and the most difficult to differentiate from depravity. The very sharpening of some of the faculties of the mind, coincident with defect, degeneration

or disease manifested in others, is generally accepted as evidence of responsibility, although it is only an illustration of that marvellous compensation in nature for failure in one direction by concentration of force in another, by virtue of which the blind deaf-mute learns to see with her fingers and to hear with her sense of smell.

Important as is the medico-legal study of this form of disease, it is not my intention to say more in that direction at present. The point to which I desire to call the attention of our Society to-day is that these same symptoms may exist, and do very often exist, although in far less degree, as the early, and often as the only, indications of the greater number of those many diseases which we group together under the name of insanity; that they may accompany chronic disease of the nervous system; that they frequently indicate acute, curable disease, and also that in children, especially, they are often overlooked and neglected because their import is not fully appreciated. By far the majority of mental diseases, taken at the time when they are recognized and placed under treatment, are absolutely incurable. For months and often for years before that time, however, there have usually been unmistakable, or at least suspicious, evidences of brain-disorder, consisting simply in slight change of character, so slight that in a case which has recently come to my attention, a young woman in the early stage of mania was advised to marry, and with sad results. I should say that it is exceptional for general paralysis of the insane and for insanity of persecution, for instance, to be diagnosticated for months after its presence is apparent; and not seldom the individual has recognized for a long time the fact that he has not been fully himself. The intellect remains tolerably clear, the capacity for affairs is nearly, if not quite, as good as ever, the memory is unchanged, the mind is often even more active than usual, at least not commonly of

diminished power, and yet the person is not himself. He becomes more readily excited, very easily irritated, neglectful of his home duties, suspicious and distrustful of his best friends, inattentive to the accustomed courtesies and refinements of life, disagreeable to his family, less truthful and scrupulous, at times slightly depressed. Less often there is simply a condition of mental and physical torpor and lowered moral standard.

These symptoms, especially if without external cause, following child-birth, fevers, brain disease, physiological changes, or any illness depressing the system, indicate a condition which needs treatment as much as a fractured leg or an inflamed joint.

The question naturally arises, "What can be expected by treatment even at this early stage of a disease in which less than one-fifth of the cases are permanently cured?" I can only answer that if we follow the advice of Sydenham, that scarlet fever is dangerous only from the interference of the physician, many of our children who might have been cured of an acute nephritis will die of Bright's disease. If we fail to examine most carefully into the causes of every slight cough, many an innocent catarrhal pneumonia will end in fatal pulmonary consumption, and an insidious pleuritic effusion will now and then kill our patient almost before we know what is the matter with him. I cannot help thinking that an earlier detection of insanity will result in its wiser treatment and in a greatly increased proportion of cures.

I should not be justified in occupying your time now in a consideration of the proper management of the obscure mental symptoms which I have described, and which for want of a better name are often called nervous, farther than to say that I believe the matter to be one which will repay careful study, and which cannot be properly dismissed, as is the popular idea at present, in the case of women at least, by putting people to bed and fattening them. I shall never

forget an intelligent lady's remark, that while her husband was rich, she had so-called nervous prostration. After he had lost his health and his property and she had something to do, she got well.

I have lately seen several cases of chorea in which the characteristic muscular twitchings were nearly or quite absent, or only observed after some physical exhaustion or upon attempts to perform coördinated movements. The usual mental symptoms existed, commonly with severe headache, and disappeared in about the usual time, if treated with rest of the brain, general hygiene, and arsenic, but persisted, if neglected or not properly attended to. I believe such mental indications of disease, independently of chorea and insanity, to be more common than has been supposed, that their judicious treatment is quite necessary to the future welfare of the race, and that their prevention demands our most thoughtful and earnest attention. I have even thought that with our present idea of education the whole available vital energy of girls at least is often exhausted in physical inactivity and intellectual development at the expense of what, in our ignorance of its exact nature, we call nervous force. For this our school system is largely responsible, and will continue to be so, until the intense strain upon mind and body is let up, and physical training and moral force receive that attention which their importance demands.

Mr. Charles Roberts, of London, than whom no one is more competent to express an opinion upon that point, has recently said, in a letter to Mr. Edwin Chadwick, "I think children are being very cruelly used by the Legislature. It took nearly fifty years, and half as many Acts of Parliament, to emancipate them from the injurious effects of excessive physical labor; but the result has been merely to transfer them from one taskmaster to another—from the manufacturer and their own parents to the schoolmaster;

and to subject them to mental strain and physical inactivity, more injurious to their future well-being than their former condition. I look on your proposal to introduce the half-time system into schools, as a sort of mental 'Factory Act' of the utmost importance and urgency, and the establishment in elementary schools of systematic physical education, as absolutely necessary to prevent great physical degeneracy in future." We may not agree literally with Mr. Roberts, but must all acknowledge that there is much force in what he says. Each human being has a certain amount of force which can be safely expended every twenty-four hours, and which can be kept fresh only by sufficient rest, food and physical exercise. The idle as well as the busy may exhaust, and more than exhaust, their daily supply, and with only one result.

RELATION OF MOULD FUNGI TO DISEASE.

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RELATION OF MOULD FUNGI TO DISEASE.

AMONG the many sciences intimately connected with medicine, Botany has always held an important place, as furnishing a larger portion of the materia medica. In recent times this science has become still more closely allied to medicine, not so much because it has afforded new means of *curing* disease, but because of the discovery that important factors in the *causation* of disease are to be derived from the vegetable kingdom. This refers to the growth upon or within the body of certain of the lowest forms of vegetable life to the detriment of the individual.

It is a fact familiar to all that most plants, in contradistinction to animals, are able to build up complex compounds from the comparatively simple ones existing in the earth in which they grow, and in virtue of the presence of green matter in the leaf, the so-called chlorophyll, are enabled, under the action of light, to decompose the carbonic acid of the air; retaining the carbon and setting free the oxygen.

This property belongs *only* to plants having chlorophyll. Those having no chlorophyll cannot elaborate from the earth and air the necessary compounds for their maintenance and growth, but can only draw their nourishment from organic matter already formed. Thus they occupy the same relation to the organic world that animals do, in that they break up complex compounds, absorb oxygen and give off car-

bonic acid. In other words, chlyrophyll plants make fuel; plants without chlorophyll and animals burn fuel.

Among the plants without chlorophyll, is the lowest order of the great class of the cryptogams; namely, the *Fungi*. Of the fungi, two subdivisions are of interest in medicine: a lower one, representing the lowest of all vegetable life, the *bacteria*, a name at present familiar to all; and a higher variety, the *mould fungi*.

Of the very important division, grouped under the general name of bacteria, nothing will be said here, but attention will be paid only to the comparatively unimportant group, from a medical point of view, the mould fungi.

It is not proposed to enter here into full details of mould diseases, but simply to consider whether *at all*, and if so, in *what* cases, the mould fungi stand to disease in the relation of cause and effect.

Before considering the characteristics of mould fungi, a word or two is necessary in explaining the meaning of terms applied to plants which can live only at the expense of matter already formed. Such live either upon dead organic matter or upon living organic matter. On dead organic matter they cause the chemical changes grouped under the terms fermentation, decomposition and putrefaction; processes which are constantly going on under our observation; they are then termed *saprophytes*.

On living matter they exist at the expense of the body in which they reside, and are then termed *parasites*. It is further quite obvious that a parasite may on the one hand exist without doing any harm to the host, beyond the small amount of nourishment withdrawn, or on the other hand that it may excite disease, either in virtue of its own presence or from some secretion from itself. Such parasites are termed *pathogenic*.

The universal existence of moulds is known to all. In damp places, on decaying fruit, on sweetmeats, bread,

cheese and various other articles, they are so familiar in producing the delicate, white or green covering that no further description of their gross appearances is necessary.

That such moulds are saprophytes, that is that they live on dead organic matter, requires no proof for its assertion. The important point is, are they parasites? Do they live upon other organisms at the expense of those organisms? further, do they multiply in those organisms and by so doing cause disease, that is, are they pathogenic?

The answer to the first question, which is, are mould fungi parasites, depends simply on observation, whether or not they have been seen growing upon or within the human body. It is a fact that their presence has been observed in these situations.

A positive answer to the question whether they are pathogenic cannot be so readily given. For, given a disease and with it a parasite, one is by no means justified in assuming that the parasite and the disease stand to one another in the relation of cause and effect. The parasite may be simply an association. Hence parasitismus does not imply pathogenesis.

In order to determine, beyond all doubt, whether in a given disease a parasite, and in the present consideration this is a mould fungus, is the causative agent, the following conditions must be fulfilled.

With a certain disease must always be associated the same fungus, and the fungus should have reached a development and numerical increase sufficient to account for the clinical symptoms.

The fungus when inoculated in another portion of the same individual or in another individual, or where this is impracticable, in one of the lower animals, should produce the disease in question. Of course failure of the inoculation in a lower animal ought not *necessarily* to be taken as proof of the non-pathogenic nature of the fungus experi-

mented with, as the susceptibility of the animal may be less than is the case in man or be wholly wanting.

A few technical terms which must of necessity be used in discussing a question like this, may be briefly explained. Aspergillus and penicillium denote two great families of mould fungi, distinguished from one another, in the main, by difference in their fructifying organs. The *mycelium* of the fungus corresponds in a general way to the roots of the more highly developed plant, and consists of a series of delicate, branching, glistening, for the most part homogeneous, fibres.

The *spore* is to the fungus, what the seed is to the higher plant, it is that part from which a new fungus can develop; like the seeds of other plants it is not readily destroyed, and like them retains its power of producing a new fungus long after the fungus on which it grew has perished. The spores develop either in special organs, on stems growing from the mycelium, or they may arise from the mycelium itself, by the process of division. In the latter case, the fibres forming the mycelium present a series of annular constrictions, at regular intervals, suggesting the appearance of a rosary. The spores when completely formed, separate from the parent stem in the form of oval or round glistening bodies, so small that they can only be seen with a microscope.

Probably most mould fungi can produce spores in either or both the ways suggested; the variation being due to the influence of the surroundings.

Mould fungi, whether in the natural or artificially cultivated condition, grow best on acid substances. They require moisture and oxygen. Some varieties like penicillium grow better at the ordinary temperature, whereas aspergillus develops more quickly at a temperature corresponding to that of the human body. These factors are of importance in considering the possibility of the growth of moulds in the interior of the body. Nägeli, a well-known

botanist of Munich, in his recent work on "Lower Organisms," goes so far as to say that it is impossible for mould fungi to grow within the substance of organs, as there exists no free oxygen in these situations. This point will be again referred to.

For those diseases of man with which mould fungi are constantly associated, Virchow, many years ago, proposed the term "*Mycoses*." The mycoses which up to the present time have been observed, are, certain affections of the epidermoid structures, skin, hair and nails; of the external canal of the ear; of the foot, endemic in parts of India; of the mouth, known as Aphthæ. Further must be considered the growth of mould fungi in certain organs of the body, of which the lungs are the most frequent seat, and finally a disease discovered and described only recently in man, the so-called Actinomycosis.

Of the diseases included in the above category those of the skin, hair and nails are the most frequent, and their true nature has been the longest known. They are:—Favus, producing the characteristic yellow crusts on the hairy scalp; Herpes Tonsurans or Ringworm, with its characteristic red rings on various parts of the body, and when affecting the beard, known as Sycosis Parasitaria; Pityriasis Versicolor, causing the peculiar brown appearance of the skin of the chest; and lastly, the affection of the nails first described by Meissner and Virchow, and termed by the latter Onychomycosis.

All of these diseases are characterized anatomically by the growth of a mould fungus either between the cells of the epidermis or in the shaft of the hair, or in both places combined. In the case of the nails, between the layers. The fungus is represented by a well-marked, branching mycelium, producing its spores by simple division and never by special organs of fructification. The fungus has in each case received a name, not, unfortunately, in accordance with

its botanical characteristics, but simply an arbitrary one. The Favus fungus is called Achorion Schönleinii; Schönlein having first discovered it; Herpes Tonsurans fungus, Trichophyton Tonsurans; Pityriasis Versicolor, Microsporon furfur. These names, given about forty years ago, are still retained, simply because botanists have been unable to give them better ones. All attempts to classify these fungi, that is to place them in distinct species, have failed. Attempts at their artificial cultivation have either, on the one hand, given negative results, or on the other such varying results that an admixture of other fungi from the air during the process must be supposed. This at least is certain, that by artificial cultivation these fungi have never developed fructifying organs, by which means alone botanists can classify them.

Inoculation of the fungi has failed to produce a like disease, and on the other hand inoculation of various ordinary moulds upon intact or macerated skin has given negative results so far as producing one of these skin diseases. It is true that Hebra, by the latter means, was at times able to produce a disease resembling favus, and at another time herpes tonsurans, and occasionally a very imperfect form of both on the same individual; but these experiments lack confirmation.

A pathologist in Berlin, Grawitz, after numerous unsuccessful attempts in cultivating the fungi of the skin affections, thinks that he has in some cases been successful, and finds further that the specific fungus is one and the same for all, and considers it to be Oïdium lactis. But by inoculating Oïdium lactis he was never able to produce anything more than a few herpetic blisters. His conclusions have not been confirmed, and should be accepted with extreme caution.

That these affections, in the natural condition, show a tendency to contagion of a varying degree is undoubted.

Favus, in spite of the luxuriant development of spores, has but little tendency, Herpes tonsurans on the other hand a far greater proneness. Although the diseases cannot be induced artificially, nevertheless experience shows positively that under conditions, not understood, transmission from individual to individual is possible.

In resumé it may be said, that in association with a limited number of diseases of the skin a more or less luxuriant growth of mould fungi has invariably been found. As the growth of the fungus increases peripherally, the disease spreads. Destroy the fungus and the skin returns to its normal condition. Further, that although the crucial test of confirmation, inoculability, is wanting, yet this negative result is not wholly sufficient to exclude the idea that the fungus and the disease stand in the relation of cause and effect, for the reasons, that the method of inoculation may have been an improper one or that there may have been a want of susceptibility on the part of the individual inoculated. For it is a matter of experience that there exists a proneness in certain individuals to repeated attacks of these skin affections, and apparently an entire immunity in others in spite of exposure.

In the disease of the nails called by Virchow Onychomycosis they become thickened, claw-like, of an opaque-yellow color and very friable. Associated with it is found a development of mycelium and spores between the lamellæ. The fungus has been regarded as identical with the favus fungus by some, and with the herpes fungus by others. But the same absence of positive knowledge exists in connection with this fungus as in those previously mentioned, and whatever has been said of those applies to this also.

Whether in the dermatomycoses in general the fungus can gain a footing and grow on a normal skin, or whether it requires some abnormal condition for it to flourish, is not known.

Related to these diseases is that affection of the external auditory canal known as Otomycosis. Instead, however, of the fungus being limited to the layers of the epidermis and consequently not apparent to the naked eye, it develops an abundant growth above the level of the skin lining the canal, often filling the canal with a luxuriant mould, which is readily recognized as such by the naked eye. Further, the mould develops fructifying organs; in this way its species can readily be made out and has been found in all the observed cases to be an aspergillus.

Associated with this growth is always an inflammation of the external meatus of a varying degree. Whether the fungus is the cause of the inflammation or simply a growth occurring secondarily on a seat made favorable for its development by a preëxisting inflammation, is not known. Most aurists who have written upon the subject think the fungus the cause of the inflammation, though the reasons given are not convincing. Others have noticed a growth of fungus in cases where an inflammatory process had been observed to exist in the ear long before the fungus appeared.

There is as yet too little positive evidence to enable one to come to a conclusion as to the pathogenic or non-pathogenic character of the fungus in this disease.

Another disease which may be briefly mentioned in connection with the external portion of the body, is one occurring in certain parts of India and known as Madura foot, or Mycetoma. It is of a very chronic nature, and is characterized by the growth of numerous nodules in the tissues about the heel, which break externally, discharging a thin, discolored fluid, and in some cases peculiar black lumps. These black lumps present the characteristics of a mould fungus which has received the name of Chionyphe Carteri. Carter, who has written the best description of the disease, thinks that it is in all cases due to the growth of this fungus, which gains entrance to the tissues of the heel through

some slight abrasion, extends deeper and deeper, with progressive destruction of the preëxisting tissues, together with the growth of the above-mentioned nodules which in turn break down, and through the external opening the discharge occurs, as already stated.

The black fungus has not been observed in all cases even by Carter himself, but where this is absent there are to be seen peculiar, pale masses resembling fish-roe, which Carter considers to be a degenerated black fungus, but which numerous authorities, and among them no less a one than Ferdinand Cohn, state to be no fungus at all, though they all agree that the black masses are a fungus.

If the numerous reports of the English army surgeons, stationed in various parts of India, in reference to the presence or absence of the black fungus in this disease, are to be credited, then one is justified in saying, that the association of the fungus is not sufficiently constant to lead one to the belief that the Madura foot is a fungous disease.

An affection of the cavity of the mouth frequently observed in bottle-fed or weakly children and occasionally in adults weakened by disease, is known as Thrush. It presents a series of snow-white patches upon a more or less inflamed mucous membrane, on the removal of which a loss of substance may or may not be observed. These patches are shown microscopically to be made up of desquamated epithelium and an abundant development of mycelium and spores. This fungus has received the name of Oïdium albicans, and probably belongs to the moulds.

According to Grawitz, who has cultivated artificially the thrush fungus, it is not Oïdium albicans, but a fungus called Mycoderma vini, which is not a mould but a yeast fungus. Grawitz claims to have succeeded in producing genuine thrush in very young animals by feeding them with milk containing Mycoderma vini. But this cannot be regarded as conclusive proof, for Grawitz fails to give satisfactory

evidence that his cultures contained no other spores than those of Mycoderma vini.

Thrush is usually regarded as a harmless disease and an eminently localized one. But Zenker, a thoroughly trustworthy German observer, noticed in a case of thrush of the mouth small abscesses in the brain, in which were mycelium and spores similar to those found in the mouth. He is inclined to think that they represent a metastasis through embolism from the primary disease in the mouth. This observation made twenty years ago has not been confirmed by similar cases.

In regard to the relation of the thrush fungus to the disease, one can only say, as in the case of the Otomycosis, that the fungus and the inflammatory process are associations. It is not proved on the one hand that the fungus is the cause, the inflammation the effect. Nor can one say on the other hand that the inflammation is primary, and that the fungus simply finds a favorable seat for its growth upon the dead products of the inflammation.

In reference to the growth of mould fungi within the body, apart from the disease Actinomycosis, a few words only are necessary. They have been occasionally observed growing in the bronchi and more frequently in cavities of the lung resulting from necrosis, and have received from Virchow the names of Broncho- and Pneumo-mycosis respectively.

The usual fungus is an aspergillus, more rarely a mucor. The mycelium grows in the necrotic tissue lining the cavity, and sends its fructifying organs out into the free cavity. It rarely reaches an extensive development, and is never found where there is any putrid necrotic process, but only in connection with bland processes. Apparently the putrid change, with its associated development of bacteria, prevents the growth of moulds.

But it must not be understood that in every case of cavity

formation in the lung where there is no putrescence, mould fungi grow; for in spite of such favorable conditions they are but rarely found; perhaps, as Recklinghausen once suggested, because there is too much secretion present to allow them to get a foothold.

That the development of mould fungi in the lung is ever anything more than an association with the necrotic processes, and not their cause, has never been claimed by competent observers. They are not then pathogenic when in this situation. In fact, it is very questionable whether they are even parasites, and one might suggest with great semblance to the truth that they are simply saprophytes, that is that they exist on the dead organic matter in the lung and not at the expense of the living tissue.

Perhaps the most important affection to be considered in the category of the mould diseases, both from its fatality and from the fact that the causative agency of the fungus is better marked, is one which has been but recently described, the so-called Actinomycosis, which is closely allied to and probably identical with a disease occurring in cattle.

Among the diseases of cattle is one characterized by the growth of one or more tumors from the alveoli or spongy portion of the jaw bone, usually the lower jaw, which after a long period of time may reach the size of a child's head, having in the mean time destroyed the bone. The tumor is of a soft consistency, on section shows a grayish white, juicy surface, spongy structure, with at intervals small, yellowish points, resembling small abscesses. Microscopically the structure is that of a granulation tissue. These tumors had been known to veterinarians under the names of scrofula, or sarcoma or osteo-sarcoma.

In 1877, Bollinger, a veterinarian in Munich, on examining nodules similar to those described, found that the small yellow masses already referred to were not fat as had been supposed, but that they were made up for the most

part of an abundant development of a fungus, the nature of which he knew nothing. He further observed that this fungus was a constant association with all the tumors. The specimens of the fungus were referred to Harz, a botanist in Munich, who stated that it was unlike anything that he had seen before, but was inclined to regard it as a mould fungus. He suggested the name actinomyces for this, apparently, newly observed plant, *aktin*, *aktinos* being the Greek for *ray*, and was applied to the fungus because the arrangement of its spores was in characteristic clusters of a rosette form, radiating out from a central point; the spores themselves being of a pear shape, large, homogeneous and glistening.

This fungus had been previously observed in connection with the same disease, though not in all cases, by Perroncito of Turin, who did not publish his results till later; also by Hahn, who failed to follow further his discovery, and quite recently, another Italian, Rivolta, of Pisa, claims that he discovered the fungus and published his results several years before Bollinger. To Bollinger, however, belongs the credit of having shown the constant association in cattle of the fungus and the tumors in the jaw, also in similar tumors developed secondarily in other parts of the animal.

Johne, a veterinarian in Dresden, deserves the further credit of having proved, by successful experiments of inoculating the fungus in healthy cattle and thereby producing similar growths, that the fungus and the disease stand to one another in the relation of cause and effect.

The first published cases observed in man were by James Israel, a physician in Berlin, in the year 1878.

A woman of thirty-six presented herself at the Jewish hospital in Berlin, with abscesses in various portions of the external surface of the body. These were opened at intervals, the contents of all being of the same character, name-

ly, a thin, foul-smelling pus, in which floated peculiar sulphur-yellow bodies about the size of barley grains and of a cheesy consistency. These bodies were examined microscopically by Israel, and his description corresponds to that given above of the fungus in cattle. He considered them to be a fungus, but not being a sufficient botanist to classify them, referred the matter to Ferdinand Cohn, who occupies the first rank as a mycologist in Germany. The latter was unable, however, to give any opinion in regard to the pear-shaped spores. This first case of Israel's died in the course of a month, under symptoms of extreme marasmus with occasional chills. At the autopsy were found abscesses in the lungs, spleen, kidneys, liver and intestine, all showing clumps of fungi like those already described.

A few months later, Israel had the opportunity of observing two other cases; in a man of thirty-six and in a girl of nine. In each there was an abcess in the neck, beneath the jaw, in the neighborhood of carious teeth. The contents of the abscesses was a foul pus with the characteristic sulphur-yellow bodies, the actinomyces clumps. These abscesses refilled and discharged yellow bodies, but finally healed under the use of carbolic acid injections.

Israel was inclined to regard his first case as a form of chronic pyæmia, due to the growth of this fungus, primarily in the lung, secondarily in the other organs mentioned. He made no attempts to inoculate the fungus on lower animals, nor was he aware, apparently, of the results of Bollinger's and Harz's work already published.

Shortly after this publication, Ponfick of Breslau reported cases coinciding wholly with Israel's so far as the presence and appearances of the fungus were concerned, but differing from the former cases in that the most striking characteristic, in certain ones, was an extensive prevertebral abscess with partial destruction of the vertebræ, associated with the formation of nodules in other parts of the body; in the heart in one case.

Ponfick, who had already had the opportunity of observing actinomycosis in cattle, saw, or at least says that he saw, that the two diseases were similar and that there existed an actinomycosis hominis as well as an actinomycosis bovis. He cultivated the fungus and had positive results in inoculating the fungus in healthy cattle. To him probably belongs the credit of recognizing the identity of the diseases in man and cattle. Up to the present time seventeen cases have been observed in man, and from these the following short resumé may be made:

The disease occurs in two forms, in a local or external form and in a general or internal form.

In the localized form the first appearance is that of an infiltration in the neighborhood of the lower jaw externally. This very slowly assumes the form of a nodule, is circumscribed, rather dense, and scarcely, if at all, painful. After a considerable interval the nodule becomes softer, fluctuates and is then usually opened by the surgeon. The contents is a purulent fluid containing the sulphur-yellow bodies, which are the fungus. The disease does not heal spontaneously as a result of the opening, but continues to discharge the fungus and pus; the cavity all the while enlarging. If, however, the cavity be injected repeatedly with a five per cent. solution of carbolic acid, it soon ceases to discharge the fungus and rapidly heals. Such a result occurred in eight of the seventeen cases. In these eight cases carious teeth were present, and in at least three cases the abscess was directly connected with the bone.

In the generalized form of the disease one has to do with the development of the actinomycotic nodules in the interior of the body. Though the exact starting point of the disease in such cases is doubtful, yet it is probable that in certain ones it is primary in the neighborhood of the jaw, extending by vessels or by gravitation to deeper tissues. Further it is probable that in certain of the generalized

cases the lungs are the starting point; the fungus gaining entrance through the bronchi. Finally in a third series prevertebral abscesses with caries of the vertebræ have been the principal characteristics.

Secondary to these may be found nodules in the pleuræ, heart, spleen, kidneys or subcutaneous tissues.

The first step is the formation of nodules of spongy connective tissue, the so-called granulation tumors, which later soften and either break externally or the softened products gravitate. By this means the process extends and a corresponding destruction of tissue occurs; the death of the individual resulting from marasmus.

Wherever there exist these nodules, the fungus is constantly found in association; where ver the fungus is present it is always surrounded by the new growth. The extension of the disease is dependent upon the extension of the fungus—and in animals inoculation of the fungus produces the disease.

With regard to the means of introduction of the fungus within the body all is theoretical. It is probably taken in with the air or food, and so long as it comes in contact with only healthy tissues c an gain no further entrance. Probably an abnormal condition, like that of a carious tooth, or some abnormality of the tonsils or respiratory surfaces, affords an opportunity for the fungus to reach the deeper tissues, there to develop as stated. The disease has only been observed in herbivora and omnivora. In carnivora it has not only never been seen, but all attempts to inoculate it have failed. This fact has been used as an argument in favor of the idea that the fungus is taken in with vegetable food.

The disease Actinomycosis fulfils the necessary requirements for enabling one to say that the fungus is its cause, and further that fungus is a specific one. Whether, however, the botanists will in the future continue to consider

the actinomyces as a mould fungus, remains to be seen. At present, comparatively little is known of its botanical characteristics.

The question which will finally occupy attention is with reference to the results derived from the direct inoculation of the lower animals with various mould fungi. As already stated, Nägeli advanced the idea that it was impossible for mould fungi to grow within the tissues of the body, as they required free oxygen for their development. That this is an error will be shown by what follows.

In 1870 Prof. Grohé and his pupil, Block, injected into the jugular vein of rabbits spores of the common moulds, penicillium and aspergillus. The animals soon showed evidence of severe illness, and died in from thirty to thirty-six hours. The lungs, heart, liver, kidneys, spleen, mucous membrane of the intestinal tract and muscles were found to be thickly studded with white or yellowish-white nodules about the size of a pin's head, looking to the naked eye like tubercles. Microscopically each nodule was found to be made up of a development of mycelium, surrounded by cells in fatty-granular degeneration. When injections of spores were made in the carotids, similar nodules were found in the brain and eye. Thus it was shown that mould fungi could rapidly develop in the internal organs of the body, cause necrosis in their neighborhood and death of the animal. Grohé termed this condition "acute general mycosis."

The positive results of Grohé's experiments excited great interest, partly because it had been thought that moulds were very harmless, partly on account of the universal prevalence of moulds and the possibility that after all they might be important factors in the causation of disease.

Many experimenters repeated Grohé's inoculations, but invariably without success, nor did Grohé himself attempt to carry out further his investigations.

Among the unsuccessful experimenters, was Grawitz in Berlin. In thinking over the subject he came to the following conclusions: that inasmuch as moulds grow best on a solid substance of an acid reaction, and whereas in the blood there exist the opposite conditions, fluidity and alkalinity, therefore the failure of development must be due to the sudden transition of the mould to a medium not suitable for its growth. He further thought that it might be possible by cultivation to gradually acclimatize the moulds, so that outside the body they would live in an alkaline, fluid substance like the blood. This he attempted with penicillium, and after twelve to twenty cultivations succeeded in getting a mould, which he considered to be penicillium, to grow luxuriantly in an alkaline fluid at a temperature of that of the body.

On inoculating rabbits with the spores of this acclimated mould, the animals died, presenting the same symptoms and anatomical appearances as did those of Grohé.

Grawitz then published it as a proven fact that penicillium, the most harmless and universal of moulds, might, by cultivation, be converted into the most virulent, pathogenic organism.

Unfortunately for Grawitz's theory, he neglected two important precautions in his experiments. In the first place he did not take pains to keep the cultivations free from admixture with other mould fungi from the air, and in the second place he neglected to further cultivate, outside the body, the mycelium found in the organs of the animals, so as to bring the fungus to fructification and thus determine whether the final fungus was the same penicillium which he started with.

Grawitz's theory has been overthrown by Koch's assistant, Gaffky, and by Prof. Lichtheim of Berne, who have shown: firstly, that penicillium cultivated purely and inoculated is innocuous; secondly, that certain mould

fungi, aspergillus fumigatus and flavescens, *without any acclimatization at all* are capable of killing animals when inoculated, in the same way, and with the same anatomical appearances as Grawitz had thought could only follow inoculation with the acclimatized fungus. Further, that the mycelium taken from the organs of dead animals and cultivated, always produced the same aspergillus flavescens or fumigatus.

Lichtheim and Leber have demonstrated that penicillium grows best at the ordinary temperature of the air, whereas aspergillus grows better at the temperature of the body. These observations, taken in connection with the fact that Grawitz neglected to keep his cultures pure, furnish the probable explanation of Grawitz's results. He undoubtedly started with penicillium, but cultivating his successive generations at a temperature of nearly that of the body, the penicillium could not thrive. There being opportunity for the introduction of other fungi from the air, aspergillus for instance, which grows luxuriantly at this temperature, the latter fungus quickly crowded out the penicillium, and so Grawitz's final fungus was a different thing from that which he started with. Consequently his fatal results were not due to an acclimatized penicillium, but to a fungus which had crept in and which in itself was pathogenic.

Gaffky and Lichtheim have proved, it would appear from their reports, that two forms of aspergillus, at least, are *in their natural condition pathogenic*, certainly as far as some animals are concerned. Thus far, however, no disseminated aspergillus mycosis in man has been observed, though it is quite possible that if these fungi were given the same favorable conditions in the human circulation that they have had in animals, a like result might follow.

It may be further stated that Grawitz's results and theories on protective inoculation, derived from experimenting with mould fungi, have also been overthrown by another of Koch's assistants, Löffler.

As yet the experimental study of the moulds is in its infancy, but it is to be hoped that before many years more light may be thrown upon their relation to disease.

In final conclusion it may be said, in regard to the relation of moulds in general to disease, that so far as the present knowledge goes there is but one disease in man, namely Actinomycosis, which fulfils the scientific conditions necessary in order to state positively that the fungus and the disease are cause and effect.

In regard to the mould diseases of the skin it answers practically to say that the fungus is the cause; scientifically it cannot be said to be proved.

Too little is known of Thrush, Otomycosis and Madura foot to allow of any opinion being expressed.

So far as other moulds found within the body are concerned, not only is there no ground for considering them pathogenic, but proof is even wanting that they are anything more than harmless saprophytes.

A STUDY OF THE ACTION OF IRON.

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A STUDY OF THE ACTION OF IRON.

ABOUT two hundred and fifty years ago Lemery noticed that the ashes of animal tissues contained iron, and fifty years later Menghini showed that this iron was not in the flesh or bones but in the blood, and in one portion of the blood only, namely, the blood corpuscles; we now know that the three grammes or about forty-five grains of iron which are in the red blood corpuscles is about all the iron there is in the human system.

That iron had specific poisonous properties was not believed, and nearly all writers, both old and modern, have insisted that no toxic action was connected with this metal, especially as workers in iron were not affected by it.

At one time I supposed myself to be the first to have proved that iron was capable of acting on the system in a manner resembling the poisonous metals, since in a full and carefully written essay on the literature of iron, published while my experiments were going on, the author states that iron is the only one of the heavy metals which has no unkind action on the system; but this was an error, two experimenters at least having observed the toxic action of iron.

As regards experiments with this metal, it should be said that the manifestations of its action are not as marked as, and its study is less interesting than, that of many other drugs, particularly those which act on the nervous system.

As a very large number of experiments were made, in a paper of this length it will be possible to give you only an outline of a few of them.

We will first consider the effect of introducing iron into the system, then the symptoms which it causes, and the post-mortem appearances. After this we will endeavor to explain the cause of death, and compare the action of iron with that of arsenic and platinum, and finally we will discuss briefly two theories regarding the tonic effects of this drug, together with some clinical facts and precautions.

In making the experiments, in order to be sure that the iron got into the system, it seemed best to introduce it directly into the veins, but this had to be done without causing coagulation of the blood, and a number of trials were made to find a suitable solution; of several salts of iron a freshly made, clear solution of the tartrate of iron, neutralized with caustic soda, was found very convenient, as it did not cause any inflammation at the point of injection, and did not in any way obstruct the circulation by causing thrombosis. A small quantity of such a solution would kill a frog in from twenty-four to forty-eight hours, and in experiments on a number of rabbits it was found that the fatal dose of iron per kilogramme of the animal varied from ten to twenty milligrammes, or one fifteenth to one seventh of a grain per pound weight of the rabbit; that is, the fatal dose for a rabbit of average size was about one third of a grain of iron. Death followed in from six to twelve hours after the injection. There were no signs of thrombosis, especially in the lungs, where one would expect to find emboli if they were to be found at all.

It will be asked, How do you know that the iron was the cause of death? may it not have been due to some other constituent of the tartrate of iron? In order to answer this question, a solution of the tartrate of soda was made, and eight to ten times as much of this as had been used of the

iron salt was injected in the same manner into each of several rabbits without causing any unpleasant symptoms whatsoever. Shortly after receiving the iron the animals seemed well, and the appetite seemed good until within a few hours of death, when a disposition to keep quiet, and an apparent weakness accompanied by frequent liquid stools, was observed. In the few cases where death was witnessed there were three or four short convulsions, accompanied by opisthotonos, lasting, with intermissions, about ten minutes, and suggesting death from asphyxia. The muscles and nerves responded to electric stimulus both immediately before and after death.

Post-mortem examination showed the small intestine to be pale and strongly contracted; the upper part for a distance of forty centimetres, about sixteen inches, from the pylorus was distinctly reddish in color; the blood-vessels of the mesentery were dilated; the liver and kidneys very much congested, especially the liver. Bladder and lungs normal; heart sometimes in diastole and sometimes in systole. In the brain and its membranes no abnormal appearances were detected. The blood in both arteries and veins was of a dirty-claret, venous color. Arterial blood also showed the same peculiar color during life, which changed to nearly normal arterial color after being exposed some time to the air.

The rabbits were all weighed; the amount of fluid and the quantity of iron injected, and the various symptoms which followed, were all carefully noted, but for the sake of brevity most of this is here omitted.

The fatal dose for cats seemed to be somewhat larger per kilogramme than for rabbits. The symptoms, which began from one to three days after the injection, were loss of appetite, vomiting, which took place as a rule directly after eating, diarrhœa, the stools being rather frequent and liquid, and loss in weight, about twenty per cent. in five days. In

one case the above symptoms continued for six days, after which both milk and meat were taken most eagerly, and recovery seemed to follow immediately. About eighty to one hundred milligrammes, or one and a half to two grains, of the iron was a fatal dose for a cat. Further experiments showed that about the same proportion, or rather less, is true of dogs. The dogs died in periods varying from twelve hours to six days after the injection.

From these facts it is evident that we have in iron probably not a dangerous agent, but at least a drug of more toxic qualities than is generally imagined.

Let me endeavor to give in outline something of the symptoms which follow the injection of a fatal dose of iron in dogs; as an example let us take a large dog which weighed fifteen kilogrammes, or about thirty-seven pounds. Into the vein of the leg enough of the tartrate of iron solution was injected to represent one half a gramme, or about seven grains,* of metallic iron. The injection took place at four o'clock in the afternoon; nothing out of the way was noticed on this day. Next morning the animal ate his food as usual, but later it was vomited; from this time on he took nothing more to eat, but was very thirsty, the water which was taken being vomited immediately. On the third day whenever water was taken it was vomited directly, and in the evening he became very weak, sleepy, apathetic, collapsed, and died.

In some cases the vomitus was at times tinged with fresh blood, and sometimes there were a number of dark, bloody, liquid discharges from the bowels. In other cases a ravenous appetite came on on the fifth day, and the animal recovered within a day or two later. The vomiting seemed to come on only to empty the stomach; it ceased as soon as this was accomplished, and returned only when something was taken into that organ; in short, its character suggested that the

* Less than average dose.

stomach was intolerant of, and sensitive to, the irritation caused by the presence of any substance, even a liquid. The symptoms directed attention chiefly to the intestines and stomach. Post-mortem examinations were made in all cases; the lungs, liver, and kidneys were found congested, but most striking were the appearances in the stomach and intestine. The blood, both before and after death, had a very dark venous color, and was the same in both arteries and veins. In detail the appearances found in the intestine in one of the cases was as follows: on opening the abdomen the intestine was found contracted and seemingly empty. The intestines and stomach were removed from the body; they were then opened longitudinally and spread out on a table. The stomach contained about fifty c. c. (about two ounces) of a thick mucus, dark brown in color, and containing blood coloring matter; the same liquid was found smeared over the mucous membrane of the upper two thirds of the small intestine. After washing off the inner surface of the stomach it was found to be of a nearly uniform dark-brown color, somewhat darker at the pyloric end. In the small intestine the mucous surface of the duodenum was of a bright blood color; on close inspection it could be seen that this appearance was made up of red points scattered thickly over the inner surface of the intestine. These appearances were confined to the mucous coat, and were found to some extent over the whole length of the small intestine, but of much less intensity in the lower portions. The lining of the large intestine was somewhat hyperæmic.

From the hardened specimens a number of sections were made for examination under the microscope. In the sections from the duodenum the villi were found much congested in many places, thus explaining the fine red points described above. Sections taken from the lung showed marked engorgement of that organ, and those from the kidneys and

liver showed congestion, though not to the degree observed in the villi and lungs.

It is not only when iron is introduced into the veins of animals,* but also when given by the stomach in large doses, that death has followed, and appearances have been found similar to those already described. But more than this, it has been observed in healthy men that very large doses of iron caused weakness, a disposition to sleep, colicky pains in the region of the stomach, and vomiting. The blood was also darker than normal.

It has lately been suggested by Beranger-Feraud† that death may be caused under certain conditions by a solution of perchloride of iron; he found that in cats and dogs death followed the ingestion of comparatively small doses of perchloride of iron if taken on an empty stomach and with a small quantity of alcohol, as these conditions seemed to favor the rapid absorption of the drug. He cites three instances where he thought death had been caused in men by the perchloride of iron, which was taken in punch, and he thinks that one or two teaspoonfuls of liquid perchloride of iron, if given on an empty stomach and with a small quantity of alcohol, would be sufficient to cause death in a man.

From our own experiments we may infer that an iron salt introduced into the system in a certain amount will cause death; this is due to the iron, and not to any other constituent of the salt, since a similar salt of another element, although given in much larger amount, causes no symptoms. Further, we have seen how the alimentary canal is conspicuously disturbed and the blood changed in color.

It will be asked of what do the animals die? Is it in any way connected with the alimentary canal, where the appearances are so marked? Probably not, as we have in

* Arch. f. Experiment. Pathologie u. Pharmakologie, xiii. Bd. 70 u. 73. Frank. Mag. f. Physiol. u. klin. Arzneimittel. u. Toxikol., 1845, ii. 369 u. iv. 173.

† Annales d'Hygiène Publique, 1879, 508.

some cases all the symptoms indicating irritation of the stomach and intestine without a fatal result; also, this seems only to prevent the animal from taking food, and death from starvation will not occur in four or five days, as animals can live a much longer time without any nourishment. It is probable that death is brought about in other ways. You remember that the blood, both arterial and venous, had a peculiar color; this suggested an examination of it. Under the microscope no changes were detected, at least not with certainty, although a change in the form of the blood corpuscles was for a time imagined; but thinking from the venous color of the arterial blood to find an unusually large amount of carbonic acid gas in it, Dr. Meyer and myself made some gas analyses of the blood, and to our surprise found the carbonic acid present in much less than normal quantity instead of being increased. In some cases only one fifth the normal amount of carbonic acid was found. Preliminary to these experiments, as no analyses of the gases in normal dog's blood could be found, it was necessary to make some, in order to ascertain the amount of carbonic acid and of oxygen normally present. It was found that in one hundred parts of blood there were twenty-five parts by volume of carbonic acid gas and about fifteen parts of oxygen; that is to say, about twenty-five per cent. of CO^2 and fifteen per cent. of oxygen. After injecting iron the oxygen was found in normal amount, but of the carbonic acid only ten to twelve per cent., one half the normal amount, and sometimes only five per cent., was present. The carbonic acid was not held in combination in the blood, as a carbonate, since no more gas could be obtained by treating the blood with acid to decompose the carbonate.

From this we may infer either that the iron in some way hinders the blood from taking up the products of decomposition from the tissues, or that the process of oxidation is incomplete.

It is not improbable that the collapse and paralysis of the central nervous system which accompany death may be a consequence of diminished oxidation; this view gains color from the fact that the amount of carbonic acid in the blood was found to be less and less the nearer the time of death. Arsenic and platinum, both of which metals give rise to diarrhœa, vomiting, and other symptoms similar to those following iron, were found to cause a similar diminution in the carbonic acid in the blood. It may also be mentioned, in passing, that these metals, as well as iron, seemed to have a similar effect on the arterial blood pressure, causing it to be less than normal. All this suggests that these metals may have an action on the economy similar to that exercised by iron.

To recapitulate: we have seen that iron has without doubt poisonous qualities; that the symptoms which it causes come chiefly from the alimentary canal, and that in fatal doses it diminishes the amount of carbonic acid gas in the blood; that the action of iron on the economy probably resembles that of arsenic and platinum, and that we are justified in believing that the action of iron on man in excessive doses would be similar to that observed in animals.

Let us now turn from our experiments and consider the *tonic* action of iron as observed clinically. For many years the good effects following the administration of this drug have been recognized, and in general two theories have been advanced to explain them: the first, that its good effects are produced by its action on the red blood corpuscle; the second, that it exerts a special influence on the digestive system. Regarding the first of these, we know that iron is a constituent of the red blood corpuscle; that in anæmia the number of red blood corpuscles is less than normal, and after using iron they are increased, so that on our first theory it is only necessary to supply a little iron in order to have plenty of red blood corpuscles; and as these notoriously

play an important part in the economy, once having a good supply of them many good results follow.

We must remember, however, that only one thirtieth part of the red blood corpuscle is iron, and that there are only three grammes, or forty to fifty grains, of iron in the blood, and only a portion of this is likely to be wanting at any time. Since there is a small quantity of iron in almost every food we eat, it would seem that any deficit in iron can never be very great, not more than a fraction of that normally present. It is also well known that it is not by a few doses of iron that its good effects are obtained, but only after continued use; if the system needs to have a small deficiency in its iron made good, it would seem that a comparatively few doses would suffice, but it is well known that it must be continued for some time to obtain its full benefit.

For the second theory, that iron promotes the action of the digestive system, the evidence afforded by experiments on animals, both when given by the stomach and the circulation, as well as the symptoms aroused in man when large doses are given, leaves little doubt that iron has some especial action on the digestive organs, and particularly on those portions where absorption takes place, namely, in the stomach and upper part of the small intestine. Since it seems to increase the amount of blood sent to these parts, and especially to the villi of the small intestine, it seems probable that it may exercise a beneficial influence on the process of assimilation. Claude Bernard* says that the salts of iron have a special action on the mucous membrane of the stomach, and that all parts with which it comes in contact take on a more active circulation. He attributes this, however, merely to its acting as a local irritant. Bartholow says that "physicians are familiar with the fact that iron improves but little if at all the condition of the anæmic when it does not increase the desire for food and the ability to digest it."

* Trousseau and Pidoux.

We find that, clinically, arsenic is often used as a substitute for iron, and with good results; there is certainly no arsenic in the blood corpuscles, but excellent results are obtained from arsenic, a metal which causes experimentally symptoms and appearances remarkably similar to what are found with iron.

As regards the blood corpuscles, may not their increase, on which so much stress has been laid by some writers, be one of the consequences of better nutrition, since in this case not only iron but all other constituents of the blood corpuscle are supplied?

As regards the prescribing of iron, it may fairly be said that among the hundreds of preparations a half a dozen may be chosen, such as the tincture of the chloride, the reduced iron, the tartrate of iron and potassium, etc., which will answer any indication, and there is little excuse for the extraordinary number of preparations of this drug.

Trousseau and Pidoux, in their treatise on therapeutics, say that they had for a long time regarded iron as an innocent drug, which it was not easy to abuse, but after more experience in practice they do not hesitate to say that they have seen patients whose death ought to be imputed to the excessive administration of iron, and they insist that in the early stages of phthisis it is especially hurtful, as it is apt to promote hæmoptysis.

The results, therefore, of experiments and clinical observations show that iron is no exception to the general rule which holds good for all the other heavy metals, such as platinum, copper, arsenic, etc. In excessive doses it would be possible to produce deleterious results, and it should not be given as if it were a medicine incapable of abuse. It would seem that the good following its use is due to its action in promoting digestion and assimilation, rather than to the increase in the number of blood corpuscles, which is probably a result of the improved nutrition.

Massachusetts Medical Society.

SOCIETY'S PRIZE.

The Committee on Publications are authorized to offer the sum of *two hundred dollars* as a prize, or honorarium, to any one Fellow of the Society who shall give, to the satisfaction of said Committee, on or before the 15th of April next, in an essay or report (worthy of a prize), the best and fullest evidence of any original or meritorious *professional work*, done by himself during the two years next preceding said date—in experimental investigations, scientific researches, or clinical observations.

Any clew by which its authorship is made known to the Committee will debar an essay from competition.

Papers may be sent to Dr. George C. Shattuck, No. 6 Newbury Street, Boston, on or before April 15, 1884, with motto and name, as usual in such cases.

FRANCIS W. GOSS,
Rec. Sec'y.

Roxbury, Mass., Aug. 1, 1883.

ARTICLE V.

NATURE GUIDES BEST, WHEN GUIDED.

BY AMOS H. JOHNSON, M.D.,
OF SALEM.

READ AT THE ANNUAL MEETING, JUNE 13, 1883.*

MR. PRESIDENT AND FELLOWS
OF THE MASSACHUSETTS MEDICAL SOCIETY;

A TRUTH so important as to prove like a diamond among other gems of wisdom, we should seek not only to cut into some sharply-defined form of utterance, but to set in such relations to other truth as will best exhibit its proportions.

Upon the seal of our Society we find, set like a brilliant of the first water, the motto "*Natura duce*," a motto so wisely obeyed, so judiciously illustrated, so eloquently taught by eminent men, not a few of whom have been members of this Society, that the truth it utters profoundly influences the modern study and treatment of disease. Its brevity sharpens the truth it commends. But it gains a peculiar pungency from the colossal assurance with which it thrusts aside all other

* At an Adjourned Meeting of the Mass. Medical Society, held Oct. 3, 1860, it was

Resolved, "That the Massachusetts Medical Society hereby declares that it does not consider itself as having endorsed or censured the opinions in former published Annual Discourses, nor will it hold itself responsible for any opinions or sentiments advanced in any future similar discourses."

Resolved, "That the Committee on Publications be directed to print a statement to that effect at the commencement of each Annual Discourse which may hereafter be published."

guides in order to place itself foremost in our thoughts. In this conspicuous position it challenges critical examination of its right to sole and supreme authority. Therefore, since the part assigned to me to-day is to address you upon some theme of general interest, I have chosen to invite you to a brief study of the meaning and limitations of this motto.

We shall not be disappointed to find that it is one of those brilliant half-truths whose importance may lead us to overstate its value; or to find that its simplicity is more apparent than real; or to find that it is only partially applicable to our professional work; or to discover that its converse is as true; so that we may as wisely say "guide nature" as "let nature guide."

The attempt to condense into two words a cardinal principle of medical study and practice, has proved rarely felicitous. But, like all such epitomized teachings, it instructs us as much by its implications as by its direct exhortation. Our high esteem for its general fitness to our needs is not decreased by recognizing the fact that it suggests corrolated truths which, pressing hard upon its limits, are the better defined, defended, and practised.

After the progress of human learning had been long retarded by the adherence of scholars to speculative philosophy; when Bacon so urged the value of the inductive method that modern science, conceived in the time of Hippocrates, had its birth; no truth flashed out into clearer light than

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this, that all positive advance in physical science must spring from the observation and proper interpretation of material evidences. This conviction then " burst as a new light in the heavens of human reason, to become like a guiding pillar of fire in that night of speculative mists." But those mists have been largely dispersed. The trend of modern inquiry follows almost instinctively and exclusively the inductive method. What was a startling exhortation may become unimpressive commonplace. New tendencies of thought change the relative importance of truth. Even the wisdom of our motto, now that it glides with the current of modern thought, less conspicuously reveals its force. The value of its exhortation sinks to the level of related truths which demand to be raised to equal prominence. A change in the surroundings, which at one time revealed in a dogma only apparent perfection, may shift the angle of their light so as to disclose deficiencies.

What is the intent of this excellent motto? It is put forth to check the imaginative and speculative study of the human system. It demands that the study of facts shall suggest and sustain our theories and methods of action. It reminds us that we cannot radically change the plan of the vital and chemical actions and reactions by which our bodies are maintained in health or are subjected to disease. It bids us first to observe the natural order, the mutual dependence, and the results of vital processes, and then to favor and expedite, rather than to interfere with, the se-

quence of operations by which disease runs its natural course toward recovery.

The superlative value of such teachings we all concede, without stopping to notice that they have one very conspicuous deficiency. An old receipt for cooking a hare began, "first catch him." The rule "*Natura duce*" is only productive when married to the rule, to guide nature. For nature only enlightens those who succeed in suitably conditioning her operations. She often leads as the escaping criminal leads the detective, or the fleeing savage his foe, when the moccasined foot selects the rocky ledge, or the bed of the running stream, or carries its owner backward over first impressions, until it can flee over a trackless path. Or, to use a milder figure,—nature is coy, and demands a cunning suitor. Won to disclose herself, anon she flees to concealment, whither she cannot be traced or from which only the most persistent and strategic lover can woo her.

When we study the history of the progress of learning two facts amaze us,—one, the failure of man through so many years to understand the phenomena of nature; the other, the patience and labor by which the secrets of nature were extorted from her. Up to the last half of the sixteenth century we have no evidence that men had learned more of electricity than that amber when rubbed possessed the property of attracting and repelling bodies, that the torpedo gave electric shocks, and that the human body sometimes emitted electric sparks. Since that time, the facts of

electricity and electro-magnetism have been obtained by the conception and construction of most ingenious apparatus, by thousands of successful and unsuccessful experiments, by keen mental analysis, by mathematical calculations, and wise theories. The rotation of a wire around the pole of a magnet, and of a magnet around a wire, was long a simple theory, until Faraday, by his great ingenuity, trapped nature into conditions where she could no longer refuse to indorse it as a fact. In 1824, on three occasions he made elaborate but unsuccessful attempts to produce a current in one wire by means of a current in another wire, or by a magnet; but it was not until seven years after, that he successfully led unwilling nature to reveal to him the fact of the induction of electric currents. Quite early in his career as an electrician, he conceived the use of polarized light to reveal the electric condition of transparent bodies. But not until twenty-three years after his first recorded trials do we find him, undeterred by failures repeated through many years, working with fresh, and at last successful ingenuity, to compel nature's assent to the truth of his conception that magnetic force and light have relations to each other. Who shall say which led in these discoveries,—Faraday, or nature? Nature repelled his advances. But, however baffled, his persistency wearied her to utter her secrets. We realize that even unsuccessful experiments were the voice of nature, saying, It is useless to seek in such directions. But this voice

is ambiguous, and as often seems to many to say, There is no such fact as you seek.

The telescope and the microscope are evidently the product of the contrivance of apparatus to determine the action of light in its passage through different media, and of the mathematical calculation of angles of refraction produced by lenses of different density and curvature, no less than they are the outcome of observed natural phenomena and laws. When with national pride we see Alvan Clark & Sons, of Cambridge, through weary months of labor, shaping with exquisite skill a telescopic object-glass of thirty-two inches aperture; or, in order to photograph the transit of Venus, preparing a plain mirror for a heliostat, which must be so undeviatingly exact, that, as Professor Newcomb tells us, if a straight edge laid upon the glass should be the $\frac{1}{100000}$ of an inch above it at the centre, the reflection would be useless; we realize that the mind of man leads nature to enter paths she would never voluntarily take, and there holds her, unwillingly subject to his familiar gaze and critical manipulations. The electrician detects her hidden movements with his galvanometer, weighs her with his electrometer. The astronomer outleaps the powers to which his own physical structure restricts him, wrests from nature her optical secrets, and, with instruments of precision, compels her to permit his eye to rove among the heavenly bodies. In like manner the student of histology, with the microscope, brushes away the veil behind which nature conceals some of her most attractive and important features.

It is common to speak of these results as the product of the applications of science by the art of man. But science is itself the product of the art of man. The unconscious forces of nature have not conspired during the last century to captivate the attention of men, or forced themselves into recognition, in order to pour into our minds the inspiring revelations with which modern science is radiant. Nature alone never led scientists to their present heights of learning. Man has won or driven nature to become her own interpreter. This has been accomplished, it is true, with more reliance than formerly upon the results of experiments and observation, but chiefly by reason of the mental activity, judgment and determination with which these results have been analyzed, and the fruits of such analysis have been made the basis of calculations, for the construction of channels through which the operations of nature must proceed, and so proceeding must reveal their method.

We have thus exhibited the fact that success in detecting, no less than in using, physical forces and their processes, demands a masterly adjustment of the conditions under which the methods of nature shall operate, no less than compliance with these methods, in order to more clearly present the same truth concerning the special department of nature in which we work; because in dealing with man we encounter all other forces combined with the distinctive characteristics of animal and mental life.

Whether we regard vital action as due to a distinct principle superadded to the properties of inorganic matter, or whether we think of it as simply another expression of chemical and physical forces, its manifestations offer special difficulties to physical analysis. Our complicated organizations present problems whose intricacy far exceeds that of any operations of inorganic nature. This intricacy is increased a thousand-fold when normal physiological action is thrown into a vast variety of those exceptional reactions and phases which we call disease. When, therefore, we assent to the soundness of the counsel in the words "*Natura duce*," we are reminded of the inconsequential remark of the notorious Duke of Newcastle, "Oh yes,—yes,—to be sure! Annapolis must be defended—troops must be sent to Annapolis.—Pray where is Annapolis?" To be sure we must follow the indications of nature, but what are they? They are like a system of guiding signals to those without the key. Through centuries these signals spelled before men the language of nature only to bewilder and oppress them. No wonder that, up to the time of Hippocrates, the history of medicine, so far as we know anything of it, was almost entirely a record of the power of priestcraft to exorcise by incantations, or to repel by amulets, the demons of disease. Yet the same nature that surrounds us, lay around and within them. They failed to understand her, partly because their minds were dominated by superstitious beliefs, but primarily because nature did not

plainly teach them how to interpret her. When at last men began to cease their futile efforts to propitiate imaginary spirits which moved the signals they saw, and set themselves to decipher nature's sign language, they perceived the nature of an appalling task, but accomplished little in its performance. For what the Rosetta Stone was to the language of ancient Syria, the teachings of Hippocrates and of Bacon were to the hieroglyphics of the human system. That stone secured only a fragmentary key, legible only to scholarly minds, and useful only to those who could use it with consummate patience and critical power. The resolve, to study the indications of nature, was not the same as their actual interpretation. The problem was not solved, but only the true direction of investigation indicated.

> "Bacon, like Moses, led us forth at last;
> The barren wilderness he passed;
> Did on the very border stand
> Of the blest promised land,
> And from the mountain's top of his exalted wit
> Saw it himself, and showed us it.
> But life did never to one man allow
> Time to discover worlds and conquer too;
> Nor can so short a line sufficient be
> To fathom the vast depths of Nature's sea."
>
> COWLEY, *Ode to the Royal Society.*

We want no better evidence of the vagueness of the signs by which nature leads us, than the errors into which the father of rational medicine fell, notwithstanding his unsurpassed powers of critical observation. Time would fail us, should we attempt to enumerate the masters in medical science, from the time of Hippocrates to the present, who, notwithstanding admirable mental gifts, have con-

tributed to medical records, together with a few additions to sound knowledge, a much larger number of blunders.

Notwithstanding the great advances made during the present century in the interpretation of vital and morbid phenomena, so much still remains unknown, that the known fails to prove an unequivocal guide. So much that is uncertain lies back of, between, and beyond the best determined facts, that their significance admits of a great variety of interpretation.

In a very thoughtful and instructive annual address, delivered in 1855 before this Society, by one of its former presidents, occurs the following statement: "The most important methods of co-operation are indicated by nature herself." This he illustrates by enumerating many facts, from which, for lack of space, we select but one class. "Vomiting," he tells us, "relieves a headache or surfeited stomach. It also attends the onset of some violent diseases, indicating nature's effort to repel them." From these facts he infers the value of a judicious use of emetics. This mode of relief, in common with others enumerated, he declares to be one "which nature so uniformly adopts and unequivocally points out." When the young practitioner attempts to act upon such suggestions of nature, he finds himself on treacherous ground, or, in other words, he finds that the indications of nature are very far from being unequivocal. The vomiting which springs from cerebral disease, from seasickness, from organic disease of the kidneys,

from phthisis, from diseases of the heart, from pleurisy, from uterine irritation, appears to indicate that nature is attempting to obtain relief by emesis. Shall we render assistance with emetics? If excessive emesis endanger the patient's life, the plain indications of nature invite us to address our remedies directly to the disturbed stomach. Yet the agitation of the stomach may be like a flag of distress from some point apparently near, but to which direct approach is either impossible or destructive. The vomiting of seasickness, quite contrary to indications, is often relieved by food and stimulants; that of phthisis by remedies to mitigate the cough; that of pleurisy and pericarditis by remedies selected with reference to the inflamed structures; that of Bright's disease by means which relieve congestion, œdema, and reflex irritability arising from the obstructed or contracted kidney.

There are many, not merely plain indications, but importunate cries of nature, which lure to death those who comply with them. The insatiable thirst which attends prolonged emesis or choleraic discharges, yielded to, perpetuates the disorder to its fatal issue. The hunger and returning vigor of the convalescent from typhoid fever prompt him to partake of solid food, to rise, to walk; he obeys nature, and in a few days dies from a perforated intestine. The relief which comes with the effusion of acute pleurisy, bids the patient to return to his usual exposures and labors ; he goes, to come again, perchance a bonanza to an enthusiastic dis-

ciple of paracentesis thoracis, equipped with his recently purchased aspirator, or possibly to the champion of permanent openings and antiseptic dressings for empyema; but personally a miserable ruminator, through a tedious experience, on the deceptiveness of nature. The adult sees the larger proportion of children pass unscathed through the ordeal of measles. He asks himself, "Shall not a man have more endurance than a child?" Confident in his acquired vigor, he treats the cough of measles according to its appearance, as an ordinary bronchial cold, and finds, too late to save his life, that "Things are not what they seem." A severe attack of scarlet fever, followed by a gradual recovery of strength, makes its plain demand for careful nursing. On the other hand, the trivial sickness, which sometimes attends the primary stages of the same disease, no less plainly guides to that small degree of care, out of which springs many a fatal case of scarlatinal nephritis. In Bright's disease, the excessive loss of albumen has been accepted by some as plainly indicating an albuminous diet to replace the portion lost. But when Pavy, by a similar direct interpretation of an unequivocal indication of nature, for a long time taught the use of a saccharine diet to make up for the large amount of sugar daily excreted in diabetes, he and his patients tasted "the sweets of adversity." The language of nature said most plainly that diabetes was a disease of the kidneys. But the physiological and chemical experiments, of Claude Bernard and others, showed it to be due to faulty assimilation, involving the glycogenic function of the liver.

The comparatively recent discovery of pathological conditions which give rise to symptoms so remote from their source that for centuries they received only fanciful interpretation, shows how ambiguously nature teaches.

It is less than forty years since the modern science of gynæcology gave us the right understanding both of the cause, and of the successful treatment, of a legion of symptoms due to uterine disturbances.

It is but fifty-six years since Richard Bright led the way to a true interpretation of renal diseases, and presented in harmonious grouping, as the related products of mutually dependent pathological changes, symptoms previously deemed indicative of special and distinct affections.

It is but a few decades since the structure and functions of the nervous system, the phenomena of automatic and reflex action, together with vasomotor disturbances, and the locality of pathological changes, were so discovered and announced as to give the key to manifold obscure disorders.

These advances have been made by determined efforts to *force* the secrets of nature. These efforts have included, not only the use of perfected microscopes, aided by all the refinements of physiological and microscopic chemistry, applied with consummate ingenuity to histology and pathology, but they have comprehended physiological experiments, which have fairly tortured nature to utter her secrets, and cross-examinations, by experiments, varied, repeated, and reiterated by a multitude of observers, in order to circumvent nature's evasive testimony.

With all desire to coöperate with nature, and notwithstanding the immense advance of modern times in knowledge of her methods, and in means wherewith to analyze her actions, we find many of the tracings contributed by nature to the chart of medical science vague, ambiguous or invisible.

After all the painstaking thermometrical study of disease, how diverse are well argued interpretations of the kind and degree of assistance for which an elevated bodily temperature calls.

Notwithstanding the too frequent repetition of the vivid clinical picture of phthisis, and the elaborate labors of the ablest investigators to detect its true causes and nature, the medical profession seem to await an Ariadne to lead them out of the labyrinth of conflicting observations into which they have pushed their way, and where at present, with microscopes pointed at some jerking bacilli, they are wondering if they behold the minotaurian monsters they seek to subdue.

The invaluable discoveries of Tyndall, of Pasteur, of Villemin, of Koch, and other equally eminent students of micro-organisms, have indicated to Lister and his school the need of a peculiarly antiseptic surgery. Yet how numerous are practitioners, equally able and desirous to obey the teachings of nature, who differently interpret these demands of nature, neglect the Listerian method, and rival his successes. The recent re-opening of the question of the treatment of eclampsia, with its revival of venesection, with its advocacy or condemnation of forcible delivery, with its en-

dorsement or rejection of the treatment by opiates, with its dispute of what have been generally considered well-established principles of action, seem, like a host of other similar examples, to give no little sarcasm to the teaching, "Treat your patients according to the indications of nature."

These discordant explanations and councils, which come from hundreds who aim to be careful observers and followers of nature, not only show how unreliable are nature's guiding signs, but they beget a wholesome scepticism concerning the possible attainment of knowledge sufficiently accurate to base upon it rigid rules of practice. If, to avoid perplexities arising from too ingenious efforts to explain and manipulate the processes of nature, one resolves to adopt a purely expectant treatment, he finds that a deferential following of nature is not so simple as it appears. It does not furnish the escape from responsibility which it promises. Our volitions must, to a large extent, determine our immediate surroundings. Variations in one's ordinary physical environment may involve the favorable or fatal action of forces as potent as any concocted by pharmacy. The more rigid one's determination to simply furnish nature the conditions under which she can the most successfully extricate herself from disease, the more imperative becomes the need of critical knowledge of all physical forces, and the manner and measure of their influence over the human body, of all physiological and pathological facts, and also of trained powers of perception, analysis and judgment,

exercised under a sense of personal obligation to control by our best judgment and activities *all* agencies which may affect vital processes.

This leads me to remark, that we gain a special warrant, for an active leadership of nature in disease, from the constitution of man. We deal not with nature merely, but with human nature. That is, with nature plus the supernatural. Or, in other words, with a physical nature united to a mind above or over it, which both directly and indirectly disturbs and controls its processes.

All thought involves molecular changes in the nervous centres. To the condition of the nervous centres the whole system is responsive, according to the law of coördinate action, whose enforcement the sympathetic system of nerves secures. Hence each thought has its physical influence for good or ill upon the remotest tissues of the body. This influence is in accord, not merely with the act and the amount of thinking, but with the complexion of one's thoughts. The physical depression produced by sorrow or melancholy, or worry or fear, and the bodily exhilaration which appears with joy, cheerfulness, faith and hope, are noticed by the most uncritical. Likewise familiar is the fact that various diseases are induced by a state of expectancy or imagination, such as the heart disease of medical students, the mental contagion of hysteria, and a host of imaginary diseases acquired by interpreting insignificant ailments in the demoniac glamour of quack advertisements. The wonderfully sensitive yet constant

participation of the vaso-motor system of nerves, in all cerebral conditions, reveals to us why prodigious bodily effects must sometimes result from apparently insignificant mental influences.

These facts teach us that the combination of forces with which the physician has to deal, contains an element not included in the studies of the natural scientist. A force, which, while a part of human nature, is itself over, not led by nature. A power which acts upon the body according to the caprice of the individual. A force which acts with vaccillating sensitiveness to immediate surroundings, or moved by impulses from thoughts remote as the years of one's life, and deep as are one's stores of information and habits of meditation.

Since we find this supernatural element, with its secret workings, exerting its influence in disease, we have no choice but to guide a control which it already exercises. Or, in other words, since physiological and pathological processes are subject to the lead of the persons in whom they occur, and since this mental action may be secretly indulged with little wise regard to its physical effects, therefore the physician must take the guidance of nature from ignorant and unpracticed hands into his own.

The fancies and schemes of patients and their friends are always a feature of sickness. When the physician has merely to displace the false notions of his patient, his task is sufficiently difficult. But how common is it to have added to such mental

hindrances a most pestiferous onset of officious suggestions! They come like locusts for multitude from the four winds of heaven. By what spell they were ever evoked from human minds, by what assurance of infallibility they each claim sole title to credence, no mortal can tell, for their harmony is discord. Yet their presence is as unmistakable as that of a pursuing swarm of hornets; although sometimes, without the valiant trumpeting of this insect, they work like the thickly-sown larvæ of the moth, silently eating and weakening the robe of council with which the doctor seeks to protect his patient. Is one smitten with sickness, scarcely has an order of treatment been initiated, when questions and suggestions and prescriptions and directions and contradictions pour in from quarters near and remote. They may spring from the unwisely expressed sympathy of friends, and from their discordant faiths in special remedies, or men, or systems of medicine, or from the enthusiasm of some clerical or lay "amateur therapeutist." But practically, they offer so many different schemes for leading the sickness to a successful issue. Amid the clash of these designedly friendly efforts, who shall retain control of the conditions and forces by which the patient is to be relieved? The successful leadership of nature amid the criticisms with which the physician is sometimes beset often demands qualities of a high order.

Who of us failed to regard with keen sympathy those of president Garfield's medical advisers who had won the confidence of our profession? Their

every word and act under the censorship of a nation whose meed of blame or praise was sure to be awarded with vehemence proportioned to the exalted sympathy of the people; yet sure, also, to be awarded in accord with judgments based upon incomplete knowledge of conditions and reasons; or upon misrepresentations of enemies sustained by incompetent critics; or upon the misuse of the surmises of eminent medical practitioners, incautiously expressed during the president's life, or framed after the autopsy had solved the riddle of symptoms which previously no man could have surely interpreted. Our sympathy arose from the fact that such experiences, in kind, occur to every practitioner. They were seen to be simply more widely conspicuous because the magnifying lens of official position focused upon them a nation's regard. To meet such occasions requires clear judgment, kindly spirit, tact in dealing with friends or foes, ruled by a resolute purpose to control all means and influences available to restore the sufferer to health.

Furthermore, when we notice the agency of moral and social customs in the origin and spread of disease, we realize that the physician is called to a leadership of human nature, of the most extensive and decided character.

The spread of the contagion of scarlet fever, of measles, of small-pox, and venereal diseases, goes on, not solely nor chiefly through its physical properties, but by reason of moral conditions, such as the indifference with which their presence is re-

garded, the absence or irresoluteness of efforts to check their dissemination, the selfishness which sacrifices the public weal to individual comfort, or the obstinacy of ignorance which will heed no council. Under the law of heredity we see disease tending to self-limitation through the feeble life and early death of its inheritors, but in the same human nature we see the passions, the mental affinities and cravings, lead men to alliances which perpetuate the worst scourges of our race. To uncleanly habits we trace the conspicuous filth diseases; to the same source we trace the exciting cause, the intractable character, the wide diffusion, and fatal issue of a long list of other diseases. We find the germ of many ailments in social excesses. We also see the liberty of the press used, not only by its nobler representatives to supply our schools and households with pages made irresistibly attractive with their wealth of wholesome thought and artistic finish, but used also by certain "fellows of the baser sort," to make vice attractive, familiar, and fruitful in retributive suffering. We see, also, a large class of nervous disorders spring from overwork: overwork due to ambition to compete in professional or business life for the higher prizes of honor or money; or to the competition in manufacturing which lengthens the hours of labor beyond human endurance; or to the overdriving and overstraining of human energies to keep pace with the increasing speed and use of machinery, the rush of the locomotive, the spur of the telegraph, the incessant call of telephone,

through the perpetual day of the electric light, and too often through the three hundred and sixty-five days of the year, unbroken by the recreating calm and comforts and inspirations of the Christian Sabbath. Such facts not only illustrate the participation of a mental element in the production, the character, and the results of disease; but they suggest that the physician's duty is not limited to the control of the special cases of sickness he treats. A much broader field of labor, a much larger class of forces, awaits his efforts. I refer to all those measures by which a public sentiment favorable to the use of the best means for the prevention of disease is created and made operative.

The science of preventive medicine is of recent growth. But the knowledge it has already gathered brings with it a peculiar responsibility. As citizens we have duties whose character and sum is proportioned to our special knowledge. No man is fit to be a physician who is not a philanthropist in the best sense of the term. A true philanthropy will impel the physician to disseminate the facts affecting public hygiene. Under our form of government the enforcement of sanitary laws requires the consent of the governed. To gain this consent we must help the public to appreciate the increasing knowledge of sanitary rules. And if, in the execution of such benevolent intent, one should accept the invitation of some charitable society, or literary association, or educational institution, to instruct an audience in hygiene or expedients to meet the emergencies of sudden sick-

ness or accident, let the way be open for him to do so without encountering the suspicion that he seeks advertisement and notoriety for the pecuniary returns they bring. The disgust created by the abuse of the press and the platform by travelling charlatans should not be allowed to abolish their legitimate use. When each member of this Society proves faithful to his opportunities to influence the opinion of his fellow-citizens concerning perils to life and health, which can only be averted by state and civil laws, with judicious Boards to enforce them, we shall soon see the people eager to release our State Board of Health from the crippling bonds which political fears cast around it, eager to restore it to its former efficiency, as a help to our profession in imparting instruction, and in saving life, and ready to treat as sacrilege all future attempts to abridge its beneficent powers.

To proceed with the discussion of our theme, let us now notice that we should not allow the doctrine of our motto to obscure the truth, that we learn much more from the mental work already done, than from any direct personal inspection and manipulations of natural phenomena. We rightly think that personal observation and experiment furnish the very bone and muscle of useful medical knowledge. But they cannot form the whole body of a sound or practical medical education. In fact, one restricted to his own interpretations of the structure and functions of the human body, however versatile and faithfully used his intellect, would prove a misshapen manikin in medical learning,

when compared with another whose very moderate mental gifts had been reinforced and devoloped by a faithful use of medical records. To trust simply to the teaching of nature is to foster conceit in one's personal powers, and contentment with ignorance.

Some, after they have advanced a certain distance by the aid of books, seem to forget their indebtedness to such sources of learning. They are overcome by the extra impressiveness of facts with which they have been personally connected, or by the flattery of successes which appear to indorse their guesses, or by pecuniary gains which too soon satisfy one with the sufficiency and correctness of his professional acquirements. In the discussion of medical questions with such men, you find that they appeal to their experience for conclusive evidence upon all questions of diagnosis and practice. They appear quite intolerant of the notion that books can teach them more than their own observations of nature, although books contain the testimony of men whose acquirements, opportunities, and records of a hundred-fold more cases of a given disease than can come to the knowledge of the ordinary practitioner, entitle them to speak with authority.

The reasons given for the study of cases to the neglect of books are numerous, plausible, and familiar. They are somewhat of the following sort: it may be said that books make theorists rather than practitioners; that they often preoccupy the mind with notions which are an hindrance rather than an aid; that they are so numerous, so

filled with minute detail which has no direct practical importance; so made up of ill-digested compilation, backed up by feeble authority, mixed up with untested novelties and contradictory suggestions,—that life is too short, practical work too urgent, and prospect of solid instruction from books too small, to warrant wide searching among so-called "medical authorities." To support such objections, one may tear from their connection and misapply these emphatic words of Sir John Forbes: "No systematic or theoretical classification of disease or therapeutic agents ever yet promulgated is true, or anything like the truth, and none can be adopted as a safe guide in practice." But after we allow their greatest force to all conceivable objections of this class, it will appear that the very persons who utter these criticisms have gained their minute and correct knowledge of anatomy and physiology, and of the symptoms and treatment of disease, more from the writings of masters in medicine than from their own work. This indicates that if at the outset of a medical career it has proved possible to gain the elements of a sound medical education from medical treatises, it should prove far more profitable for the experienced practitioner to gain instruction from similar sources, since ability, wisely to compare the statements and reasonings of authors, is sure to increase with advance in knowledge. Moreover, all comparisons of the study of nature with the study of books to the disparagement of the latter, simply amounts to an enumeration of difficulties.

Trials are to be met in any department of learning. Nor do impediments to learning exist in books to so great a degree as in natural phenomena themselves. Allegiance to the guidings of nature cannot be maintained without loyalty also to faithful human records of nature. Nature and literature are not rival claimants to our service. We must not serve them with partisan spirit, nor bring them into antagonism. A large part of the usefulness of personal experiment is to qualify us to understand and pass judgment upon thousands of published researches, which bring revealing light to much in our experience that must otherwise forever remain obscure. We cannot but notice that the wisest and most instructive teachers in medicine, men who have discoursed most forcibly concerning our duty to observe and conform to nature's methods, have been indefatigable students of medical literature. Their wisdom is evidently the result of a life-long study of the methods in which reason has been applied to explain and treat disease. They have learned as much from the detection of errors as from the discovery of new truth,—errors which both they and their successors might have gone on repeating, had not their real character received copious illustration in medical records.

There are certain circumstances or conditions which do not reveal themselves to the direct observer of nature. Their presence will not even be suspected until they are suggested by the clashing of the published conclusions to which wide and careful investigations have led. Methods of treat-

ment shown by a careful analysis of cases to be almost uniformly successful in one epidemic of scarlet fever or diphtheria, prove of feeble efficacy in other localities, or in the same locality in another epidemic, although used by the very persons who thought they had demonstrated their value. These uncomforting results convey the first hint that some conditions have been unregarded, and that our search for and weighing of evidence must take a wider range. Left to ourselves, we might spend a life time in searching among local causes for that which is independent of them, nor once have our attention called to the energy of those more universal, but imperfectly understood, causes of disease which exist in atmospheric conditions, or in the very laws of chemical and vital forces.

The fact that such suggestions do not reveal the precise source of a specific disease, or the full reason for its method of action, does not annul their value. For even when they fail to indicate with exactness the direction our explorations should take, they rid our minds of many false conceptions ; they awaken us out of contentment with inadequate explanations ; they give importunateness to our curiosity.

If it be true, then, that medical literature must furnish us by far the larger portion of our knowledge of facts relating to our own bodies in health and disease, that it treats these facts with explanations which have required centuries for their development, that no comprehensive view of nature can be obtained without its aid, that it points

out unproductive methods of study, into which we are sure, if unwarned, to fall, that it hints to us how and in what direction to most successfully push inquiry, that it unfolds the meaning of nature so as to make it more possible to conform to her efforts to maintain health; if this be true, then we may cry, Wisely heed the records of human experience and reasoning, as urgently as we cry, Heed the teaching of nature. Let us not concede to nature the power to convey the best knowledge of herself. For this work she lacks the means. They are the hardly won product of human reason applied to nature.

When we compare the writings of the most popular teachers of medical science, although we may select those who are among the wisest exponents of the law of conformity to nature, we find that nature receives a great variety of interpretation. What occurs to the best trained inquisitors is sure to occur in much larger measure to ordinary practitioners. The sincerest attempts to understand, and to act according to nature's methods, are sure to exhibit more or less of not incongruity merely, but of mutual contradiction. Practically we are guided not so much by the actual meaning of observed conditions, as by our conceptions of them. When we consider the innumerable elements of which our bodies are composed, the intricate coördination of bodily functions, together with the vagueness of the signs which reveal their action, we realize the infinite number of combinations into which they may be thrown. If we re-

flect then upon the varying degrees of incompleteness, disorder, and maladjustment which characterize much of our general knowledge of nature, we shall be impressed with the fact that the physician has no task which should take precedence of his need to bring his conceptions of nature into the highest attainable accord with her actual conditions. To do this more is required than to store the memory with ascertained facts. The natural relations of facts must be sought. They must be mentally set in their proper connections, or, when these cannot be determined, they should not be fancifully linked together, but allowed by standing in isolation to provoke curiosity. This is not the work of nature, but of that which is placed over nature, the *super* natural, the human mind and reason. For although natural phenomena have their place in a definite sequence or order of actions, this sequence is often unknown or exceedingly obscure. Whether the indications of nature shall actually instruct and guide one depends upon the condition and habits of the mind which perceives them. We group facts received, according to knowledge already acquired. We value, sort them, and find them suggestive, largely in proportion to our possession of associated truths, but still more largely in conformity with preconceived notions and critical or careless methods of thought. The exhibition of a fact or the statement of a principle in the presence of many different witnesses may awaken in their minds as many different suggestions. Thoughts thus excited may

pursue a course, tangential to the truth announced, or revolve around it in the narrow circle of ideas which at the time rule the mind, instead of following it through the course prescribed by its correlation with other verities. A familiar illustration of this truth comes to us when even some of the more common physiological facts or phases of disease or methods of treatment are brought before any large body of physicians for discussion. Then appear more or less wide differences of conceptions, inferences, and conclusions. These often reveal more concerning their originators than concerning the mooted subject. We may quite plainly trace the source of incongruous ideas to different classes of minds. Such observations teach us that the leadings of nature have no higher value than a man's mental characteristics allow them. They do not irresistibly draw one to right reasoning and action. They do not necessarily assume in any given mind their own natural order. What guiding light they offer may suffer so much of refraction and polarization from the mental media through which it passes, that its rays, if not extinguished, cannot be traced to their source. It is wise to insist that he is not fit to be a physician who is not a careful observer of nature. But it is as necessary to insist that observation is not interpretation. To see is not to learn. The revealing power of facts lies not in themselves but in the mind which perceives and uses them. Nature can only lead the mind which is equipped to trace and follow her.

So it happens that all disease has, beside its actual form and history, other ideal forms which may differ widely from the reality. Could we collect the mental pictures of disease of the earlier centuries of medicine, and, giving them visible form, place them beside the conceptions of succeeding generations, their resemblances and relative fidelity to nature might be likened to the incongruous pictures to be found in art museums, where Indian, Egyptian, Chinese, Japanese, and ancient and modern drawings, hanging together, mutually question each other's correctness. If we select for comparison only those notions of disease and its treatment which are common in our own day, we shall find, even among interpretations defended by professed students of nature, conspicuous disagreement. This proves true not only when such recondite matters as the essential nature of disease germs or molecular action in pathological processes is discussed, but in the interpretation of common cases in everyday practice. Accordingly the practitioner finds that in a given case of sickness he has several forms of disease presented for treatment. First, he has that which nature herself presents in the patient and his surroundings. Second, he has a variety of representations of the nature and proper treatment of the malady gained from books. Third, he has the conception of the disorder indorsed by the minds of the leading physicians of his day, which should be a digest of the teachings of the best authorities with some modern light thrown in. Fourth, he has the popular conviction concerning

the source and character of the ailment, which is very far from proving invariably wrong. And fifth, if he wisely steady himself against vacillation, and reason his way through conflicting suggestions, he forms his own conception, which should be the resultant of all the testimonies enumerated, plus that of his own thought and observation. It is this ideal form which each skilled physician treats. This furnishes his working plan. He gains only its faintest outlines from the bodily conditions he witnesses. Yet it is not the product of the imagination. It is constructed from a more or less extensive familiarity with authorities and out of one's experiences, with trained powers of analysis and judgment. Whether this ideal shall prove a caricature, or be a true and perfect reproduction of nature, will depend not so much upon nature's teaching as upon the contents and action of the mind which receives it.

The symptoms of disease are suggestions rather than revelations. Their meaning appears according to the number and illuminating power of the lights of knowledge already in the mind. The novice gains little or no help from the most instructive microscopical preparations. The microscopist reads from them the secrets of histology and pathology; for every microscope requires two reflectors, one below the objective and the other above the eye-piece, to illumine what is transmitted to the eye with numberless rays of antecedent knowledge. The ordinary traveller on the railroad gains a more or less fleeting pleasure from the

scenery. The artist by his side detects combinations which furnish long-sought features to give completeness to many nascent conceptions, and sometimes even permanently build themselves in as the choicest elements of his style. The geologist, on the same car, receives what enters through the eyes of his fellow-travellers into darkened chambers of their minds, into scenes of tropic vegetation, or of fluvial action, or of glacial movements, or of volcanic disturbances; so that his enthusiasm may lead him, as it did Sir Charles Lyell, to ride for miles with his head thrust out of the car window, to glean from the sections of the hills hieroglyphics, which filled out for him already partially learned paragraphs in the records of nature.

So the forms of disease we treat are an hundred-fold more numerous than those in the most prolix nosology. The visible phases of disease are but its outer garb, often its disguises. Each physician conceives of such forms beneath the ample robe of symptoms as the extent or narrowness, the accuracy or incorrectness, the wise or fallacious use of his learning, may picture in his mind. If content with superficial learning, he may always mistake a few external signs for the real malady. If somewhat better informed, he will recognize the general or local character of an affection, and the portion of the body most affected. If still better instructed, he may determine the central source of the symptoms, and classify the organs which are secondarily and sympathetically affected, and separate sequelæ

and complications. With still wider knowledge, he will have before his mind the microscopical anatomy of each organ, the portions which the disorder chiefly elects to disturb, and the natural sequence of troubles to which these disturbances give rise. Into the delineation of his picture of the disorder will enter not only an accurate knowledge of anatomy, physiology, histology, pathology, and chemistry, but the thousand and one helps which come from all departments of natural science, and from broad culture in history, philosophy, and the arts. The broader the resources of the mind, the more wisely can it apply any special knowledge relating to human beings.

The differences between our conceptions of disease are not likely to prove those of degree merely, that is, of completeness or incompleteness, but in kind, that is, between true and false; since the ideas gained from a partial acquaintance with conditions may be quite the reverse of those conveyed by an entire and exhaustive knowledge. The sum total of ascertained facts may lead to correct diagnosis and treatment, when a large per cent. of the same facts, although indications of nature, would lead only to error. We may compare the manner of nature's leadings to the process of chromo-lithography. The visible features of an illness stamp the first impression, which gives little suggestion of the figure and coloring which is to follow. Systematic questioning to elict the condition of the nervous, respiratory, digestive, circulatory, secretory, and other organs and functions, strikes in additional

lines and shadings. Methodical physical exploration, with mechanical and chemical aids, impresses new colors, which tone and reinforce those already produced. The process of diagnosis by exclusion, by its pressure, causes the entire disappearance of many tints, and so blends and contrasts the remainder, as to reveal still more the proportions and complexion. But the figure is not complete. It goes on to receive imprints from one's more or less exact knowledge of the natural sciences, from one's knowledge of mental influences, of social customs, of whatever products of human thought and deeds he has studied, since they all reveal somewhat of the physical powers, habits, conditions, and tendencies of human beings. And above the value of the number of special impressions from special blocks of learning, which are needed to perfect the conception, is the skill which so delineates and applies them, that colors and shadings fall with undeviating exactness upon the spots to which they belong.

There is no power to guide us to the right understanding and treatment of disease, like that which takes the raw material of natural phenomena, and with the fingers of the intellect interweaves them with sound philosophy and learning into accurate fac-similes of nature.

This truth carries us on to affirm that the time has come when the cries "*Natura duce,*" and "Search out the secrets of nature," should at least share their prominence with the exhortation—Master the revelations of nature.

More than thirty years ago, the revered author of "Expositions of Rational Medicine," in an address on "Medical Education," wrote as follows: "In modern times, the constituent branches of medical science are so expanded that they are not acquired by any physician in a life-time, and still less by a student during his pupilage." Since then, the name of toilers in the different departments of medicine is Multitude. They have wrought with trained and critical observation, with the light of the past to guide them, and with determination to push investigation to its final limits. They have penetrated to conditions of vital processes where material forms subdivide into atomic minuteness. Their importunate searchings for the secrets of nature have been richly productive. Each from his own department has contributed either new facts which shed direct light upon the processes we seek to manipulate, or more rational interpretation of old facts, or the negative results of wisely conducted experiments, which erect so many light-houses and buoys to mark out the right channel of investigation. The fruits of such studies appear each year in modest yet invaluable contributions to numerous foreign and home journals, and, after due allowance for errors and fallacies, a wealth of knowledge thus scattered in fugitive form, like the snow, has silently accumulated in quantity sufficient, if rightly distributed, to smother beneath its pure surface of truth a huge body of errors. But as the falling snow strikes the running stream and vanishes, or alights upon the

ocean the live-long winter without leaving a trace, or by the winds is swept from the highway, or piled upon it in obstructing masses, so the beneficent influence of innumerable contributions to medical science is lost upon unappreciative minds, or whirled away by the pressure of daily practice, or heaped in appalling bulk before the studious practitioner, who must open and grade and make for himself a highway by means of, upon, and through them. The sum of these additions to our knowledge of nature in modern times has assumed an overwhelming magnitude. It involves such intricacy, such fineness, such extensiveness of details, as to warrant the lamentation, not that so little is known of nature's methods, but that we gather, comprehend, analyze, and utilize so little of the knowledge already communicated.

The leadings of nature may demand so much of mental vigor in the search for the minutest ultimate elements, as to preclude a comprehensive and practical knowledge of general principles. In this way the acquisition of fresh facts at times threatens to perpetuate, as well as to remove, error. Nature then leads with irresistible traction. She may run away with a votary, or captivate him with the attraction of a special class of truths, or surfeit his mind with exceptional items, or swallow up his enthusiasm in a flood of miscellaneous facts, or even crowd him into imbecile skepticism by the contradictions and paradoxes of unsystematized teachings, until he is prepared to use these words of Milton:—

> "That not to know at large of things remote
> From use, obscure and subtle, but to know
> That which before us lies in daily life
> Is the prime wisdom: what is more is fume,
> Or emptiness, or fond impertinence,
> And renders us, in things that most concern,
> Unpracticed, unprepared, and still to seek."
>
> PARADISE LOST, Book VIII.

The student finds willing and competent guides to the remotest limits of medical science. They take him over fields of research and discovery so vast, that as one's mental endurance and time are waning, he finds himself simply laboring upon some rapidly expanding boundary of knowledge, and so carried more remotely from departments of study which are no less legitimately related to the pivotal facts of medical science, but which lie in the opposite direction.

Since the supply of recorded medical knowledge already exceeds the strongest mental power of digestion, he, who labors chiefly to add to this supply, may tickle the palate of some epicure in medical lore, or perchance add a relish, or stimulant, or corrective to increase the popularity or nutrient properties of verities already furnished, and occasionally gain a flattering distinction for original work. However legitimate such work for the purely scientific man, the practitioner labors more wisely, who seeks to ascertain the form, the proper order, the proportions, the compatibilities, the relative value, and the timely applicability of the facts already known. This broader use of facts maintains mental health, mental hunger, and power to assimilate what is needed to correct impressions,

to justly balance judgment, and to provide a larger variety of expedients for the relief of sickness than any strictly original investigations could compass.

The immensity of the body of facts, by which nature now offers to lead us, often proves discouraging. It inclines one to seek the pith of all preceding wisdom in some recently announced and easily comprehended novelty. But an oft-repeated lesson of experience teaches, that we are not to expect that the discovery of any one or more secrets of nature will furnish some easy and sure way of detecting the true nature and treatment of disease. The voluminous results of the laboratory work of physiologists, the weekly published observations of skilled practitioners, give no hint of a discoverable panacea. They only reveal with growing impressiveness the increasing number of elements and conditions whose complex reactions produce the harmony and the discords of nature, but whose recognition and tabulation add just so much to the student's work to ascertain their relations and to use their light.

This work is to be done by diligent comparison and classification and generalization. If we had this work to begin we might find the present amount of revelations of nature as blinding as the noonday sun to the owl. Even with the powers of a Cuvier, or a Humboldt, or a Goethe, or a Darwin, we might as well seek to measure the ocean with a pint graduate, as to gain an exhaustive knowledge of all the facts on which medical prac-

tice is based. But this ocean, filled by the rills and rivers of knowledge which flow from every centre of learning, we can explore with the aid of general principles already framed and indorsed by the concurring experience of former generations. These principles furnish, as it were, vessels into which we gather material to strengthen, enlarge, and sometimes to reconstruct them, and by their aid we discover new means of exploration.

I should be recreant, indeed, to my sense of justice, if I did not here make mention of that indispensable guide through the sea of medical periodical literature, the "*Index Medicus*." May it receive from members of this Society, according to its needs, if not according to its invaluable worth, support sufficient to save its brilliant light from extinction.

A popular humorist has said, that "all we need, to possess the finest navy in the world, is ships, for we have plenty of water." So with less sarcastic intent we may say, that all we need to have the best possible knowledge of nature is brain-work, for there is plenty of knowledge.

It is no time for us to cry most urgently that nature would lead us with fresh revelations. Our minds, already over-taxed by the number, the wide distribution, and recondite relations of ascertained facts, are more likely to be distracted than enlightened by their increase. Overweighted powers weaken, stagger, and go astray. I urge the statement that we need more than any fresh contributions to the details of nature's workings, a proper mastery and use of the items of knowledge which

await our acquaintance and our judgment. Why grasp after fresh keys wherewith to unlock the mysteries of life and death, without faithfully and vigorously using those already in our hands?

The line of thought we have thus far followed, but upon which the waning hour will soon command us to halt, brings to view a fundamental principle which contests with our motto its claim to supreme importance. It is a principle which lies at the foundation of success in any one of the learned professions: namely, the rule to specially train the mental powers for their special work. Masterly discipline of the thoughts kindles reason into a guiding light of no less importance than that from the simple indications of nature. The reason which seeks first clear conceptions of material facts, and then so combines them that their logical reactions produce mental heat and light, quickening us to further investigation, this is our chief guide, the guide of all other guides, the employer, the director, the judge of guiding nature.

Medical practice consists in the adaptation of a knowledge of several sciences to prevent and alleviate disease. The effectiveness of such adaptation is dependent upon and subject to all the variations of individual judgment. To secure a measure of exactness and agreement in practice which will make the real scientific basis of our work more apparent, we must labor to train our minds to systematic, severely thorough, and scientific methods, and cautious judgments. The rational basis of honorable modern medical practice

is too often needlessly exposed to public suspicion. We meet a much larger conflict of opinion than the state of medical learning, or the intrinsic obscurity of medical questions, justifies. How often does a chilling mist of mortification cool our just pride in the actual advances in medical knowledge, when we read what is simply professional testimony, under the title "expert testimony," although it may reveal to every studious physician lamentably slipshod analysis of half-acquired facts, and random opinions unsustained by any logical use of the evidence in the case, or by any personal experience, or by any known scientific demonstration.

The physican's study and discipline of himself is one of the most important parts of scientific medicine. We are told that "Goethe looked upon his own personality, and its relation to outward things, as so necessary an ingredient in his scientific labors that he would not separate these learned investigations from his every-day existence. Hence the stress which he laid upon his personal condition when pursuing his scientific studies." The application of the rule, to allow nature to do her best work in the healing of disease, must extend to the physician's observance of the laws of nature in himself. Of what use is the microscope if the lens be clouded with dust? Of what use the pharmacopœia if the labels are gone? Of what use the knife when its edge is consumed with rust? In like manner, of what value is the physician whose mental optics, and powers, and knowledge,

and acumen are blurred and blunted and unavailable by reason of negligent preservation and preparation for their work? No less indispensable than a knowledge of anatomy, physiology, pathology, materia medica, and all related sciences, is the work of measurement of one's mental tendencies, detection of one's mental deficiencies, strengthening of one's mental weaknesses, and adaptation of one's mental processes to the end to which our lives are to be devoted; a work to be indefatigably pursued in order to make one a worthy disciple of rational medicine. That we do not overstate its importance appears from these words of Dr. Jacob Bigelow, contained in an address on "Medical Education": "The subjects," he says, "most important to be well taught in medical schools are the elementary principles which constitute the frame-work of medical sciences, *and the mode of thought and inquiry which leads to just reasoning upon them.*"

Confirmatory of the same suggestion are the words of Sir J. Forbes, which appear as the twentieth specification of things most important for medical men to think and act upon. "Lastly and above all," he writes, "to bring up the medical mind to the standard necessary for studying, comprehending, appreciating, and exercising the most complex and difficult of the arts, that are based upon a scientific foundation,—the art of practical medicine. And this can only be done by elevating the preliminary and fundamental education of the medical practitioner."

We have to congratulate one another that among the founders of this Society, were those whose wise counsels gave rise to early efforts to provide thorough medical instruction. The apparent disorder of first efforts, when the constituents of every department of medicine were turned into the mental stomach of the student in the same year, has, like a first confused gathering of foundation stones, disappeared in the construction of the systematic curriculum of the Harvard Medical School; a curriculum of which the architectural symmetry and fitness of the new building is not too strongly typical. Yet the convictions of the wisest of our profession, which are so clearly expressed in this costly provision for higher medical education, need re-enforcement from the words, and practice, and personal influence of every member of this Society.

Public opinion concerning the requirements of a well equipped medical practitioner still needs to be carried forward. There should not be simply here and there a few among the liberally educated who realize that prolonged study and severity of analytical reasoning are required for sound medical, no less than for sound judicial, opinions. With the increasing popular knowledge of some of the sciences on which modern medical practice is based, we may hope that for one to rush into practice with no more training than that afforded by a common school, and the briefest possible attendance on medical lectures, may seem to the public preposterous, and prove unprofitable. We believe that

the time is not far distant when the present exemplary thoroughness of a Harvard medical education, which now seems like the light of an Argand burner compared with the farthing candle of its beginnings, shall pale its brilliancy before the electric light of its future influence, when it shall re-enforce the example of the Johns Hopkins University in Baltimore by opening a medical course of at least four years only to those who have had a special preliminary training of three years.

When that time comes, nay, before then, we may hope that there will be found, among other new provisions, a chair from which shall be taught, separately from strictly clinical instruction, the rules and methods by which investigations shall be made, evidences collated, and courses of reasoning pursued in order to avoid judgments on insufficient evidence, and false opinions from misuse of evidence. Such a course of lectures, with copious illustrations of clearly defined principles, would send the beginner to his work zealous to observe the lines of scientific progress, and guarded against many deviations which misapply efforts, and beget misleading habits of thought.

Farther pursuance and wider application of our discussion I hasten to leave with you. If any of the utterances of the past hour have seemed oracular in form or tone, they have been prompted by no oracular spirit. They have been made with no hope to fix with invariable exactness the lines of truth. They will accomplish that for which I

have intended them, if they shall in some measure quicken desire and endeavor to be thorough in professional study and work. One who is unable to offer a novel contribution to science, may hope by re-phrasing old truth to give it fresh influence. I have sought simply to rustle the leaves of the tree of knowledge already in your minds, so as to quicken their call for nourishment. The thought that I had suggested disloyalty to the truth of our motto would bring with it a sense of sacrilege. For I have hoped to increase rather than to tarnish its lustre, by blending with its light the rays of a truth which gives inspiration as well as illumination. With the oppressive fact of our subjection to the laws of matter, let us couple the fact that nature's dominion is a *limited* monarchy. This gives us buoyancy in our work. This reminds us of our imperishable natures, under whose dictation the material universe is made to contribute to human exaltation. This truth we detect in the survival of the work, and the spirit, of many members of this Society, who, though now mingled with the dust, still, through us, maintain over nature the dominion of their thoughts. While, therefore, we keep the words of our motto upon our seal, as a reminder of a historic epoch, as well as the announcement of a vital principle, let us mentally tone their exclusive form, so that to us they shall always read,—

Ratione et natura ducibus.

A CONTRIBUTION

TO THE STUDY OF

THE TUBERCLE-BACILLUS.

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OF JAMAICA PLAIN.

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A CONTRIBUTION TO THE STUDY OF THE TUBERCLE-BACILLUS.

KOCH'S (1)[1] announcement in the Spring of last year of his discovery of the specific organism lying at the bottom of and being the cause of tuberculosis, marks an epoch in the history of this much-discussed pathological problem such as it had never known before.

Beginning with Villemin's (2) experiments tending to show the inoculability of tubercle, this subject has attracted attention from the best observers of the time ever since, and their results have tended more and more to show the communicability of the disease. The strides of microscopic pathology and the facts observed in regard to micro-organisms in other forms of disease, have assisted in preparing scientific minds for the discovery that is under consideration to-day.

The importance of Koch's facts has led to an immense amount of work in the same direction, for purposes of confirmation or refutation. It is now more than a year since his results were first given to the public, and a review of what has been done since then will be of interest and importance. No discussion of the individual papers will be attempted, and only those will be mentioned which have for their object the determination of the existence of the tubercle-bacillus and its significance.

Koch's results—after a long series of experiments, in

[1] See references at the close of this paper.

which he not only discovered the organism which he claimed to be the actual cause of tuberculosis, but proved the assertion by the most careful cultivations and inoculations—are now so well known as to require little comment here.

Since the publication of his experiments, investigations have been carried on with a view to the discovery of the tubercle-bacillus in all the morbid processes known as tuberculous. In all of these experiments, the proportion of success to failure has seemed to grow larger as observers have become more familiar with the manipulation necessary for the demonstration of the bacillus. The few who have directly denied its existence in the tissues, or its pathological significance if there, have either seen reason to change their views or are still at work upon the problem. Before Koch, there were other observers claiming the discovery of the specific cause of tuberculosis—thus: as the result of his work, Klebs (3) had announced his monas tuberculosum—an actively-moving organism; Schüller (4) and Toussaint (5), a spherical micrococcus; and Aufrecht (6) speaks of a rod-shaped organism, which he found in the centre of tuberculous masses and which he now claims to be identical with Koch's bacillus.

From all of these, Koch's discovery differs, in that it has no movement, is rod-shaped, and more than twice as long as it is broad—being from one-quarter to wholly as long as the diameter of a red blood-corpuscle—and in that he has isolated his discovery by cultivation and has produced the specific disease with the result—which none of the others have ever done.

Entering now upon the discussion of the papers that have been brought out by Koch's work, we come first upon that of Machiafara and Celli (7), who published results showing that they had found the bacilli in fifteen cases of phthisis—one with hæmoptysis and no physical signs—and in the

stools of phthisical patients in great numbers. They examined also, and with negative results in every examination, thirteen cases of other lung-disease.

Formad (8), after what he considers exhaustive research, grants that bacilli are present, but not invariably: he thinks that they may be the *causa mortis* by producing a fatal result in a process which would otherwise not be so, but he does not ascribe to this organism any quality which would make it a veritable *causa* or *materies morbi*.

Balmer and Fräntzel (9) find the bacilli in enormous numbers in rapid cases of phthisis, and less numerous in the more chronic ones. "Infection fever" was always present in the cases in which bacilli were present in large numbers. They found bacilli very numerous in the tissue of tuberculous lung, in the walls of tuberculous ulcerations of the intestines, and in the pus of tuberculous joint affections. Their observations lead them to the following conclusions:—They found the tubercle-bacillus in the sputum of one hundred and twenty cases of phthisis without exception. In the cases of lung disease not tuberculous, tubercle-bacilli were never found. Therefore when they are found in the sputum we have a case of tuberculosis. On the other hand, when they are absent after repeated and careful examinations of the sputum, tuberculosis of the lung may be excluded. They consider that a perfect prognosis of a case may be given as the result of repeated examinations of the sputum extending over a period of weeks or even months. They also conclude that the most favorable soil for the growth of this bacillus is in the cheesy contents of a cavity rather than in its walls.

Hiller (10) thinks it possible to formulate the dogma that "Initial hæmoptysis is a symptom of the infection of the lungs, standing in the relation of effect to cause."

Schmidt (11) thought he had proved that the so-called tubercle-bacilli were fat crystals—because they disappeared

if treated with ether. Hirschfelder (12) has however shown that even after boiling the cover-glass in ether, and washing in fresh ether, the bacilli may be readily demonstrated by Ehrlich's method. Schmidt probably dissolved out the coloring matter, and has himself since come to a belief in the bacillus.

Ransome (13) demonstrated the bacilli in the expired air of cases of undoubted phthisis.

An opponent of Koch's views on the specific nature of the tubercle-bacillus is Balogh (14), who says he has found bacilli in the marshes around Pesth, which are indistinguishable from the tubercle-bacillus. Inhalation experiments with these bacilli caused nodular growths in the lung in which the tubercle-bacillus was found; and inoculation with scarlatinal urine and with bronchial sputum gave the same nodular growths. He took no measures—so far as reported—for the absolute exclusion of the tubercle-bacillus.

Prof. Koryani (15) found Koch's bacilli in the sputum of a case which had been regarded as one of pulmonary syphilis; by this means a correct diagnosis was reached.

Guttman (16) has been unsuccessful in his researches, only finding the bacilli four times out of one hundred preparations of phthisical sputum—all prepared after Ehrlich's method.

D'Espine (17) finds no correspondence between the number of the bacilli and the stage of the disease.

Lichtheim (18) has found bacilli in the sputum of patients with cough, before the lungs present any sign whatever. He considers, however, that the point of origin of inflammation must have some communication with the air passages before the bacilli can be discovered in the sputum, even in well advanced tuberculosis. He found bacilli in the stools of intestinal tuberculosis, and especially in the ulcerations of the intestinal wall—he also found them in cases of tuberculous peritonitis.

Chiari (19) thinks that the number of the bacilli is in direct proportion to the severity of the disease. He has never found any other bacilli staining as does Koch's.

Heron (20) believes that the tubercle-bacillus furnishes a good prognostic guide, and that the more numerous it is, the more rapidly fatal is the disease.

Smith (21) demonstrated the tubercle-bacillus in the expired air of consumptives.

Pfeiffer (22), after a great number of observations, comes to the conclusion that the bacilli can always be found in the sputum of advanced tubercular disease of the lung, but that the examination must be repeated a great number of times before the definite exclusion of bacilli can be reached.

Babès (23) of Pesth demonstrated the bacilli in the urine of three patients, in two of whom tuberculous nephritis with ulceration of the pelvis of the kidney was demonstrated afterwards in post-mortem examination; in one there was also tuberculous ulceration of the bladder.

Crämer and Menche (24, 24[a]) both consider the tubercle-bacillus as a diagnostic landmark. Crämer, however, found an organism staining like the tubercle-bacillus in every case in twenty examinations of healthy stools. Menche claims that the examinations are liable to error because of imperfect staining—and further, that possibly tuberculosis of the intestinal wall may be only manifest in the stools.

Fränkel (25) found numerous tubercle-bacilli in the pus of a scrofulous- or tuberculous-joint, and Dreschfeld (26) confirms this by the same observation in a case of the same nature in the ankle. Fränkel has also found the bacilli in the secretions covering laryngeal ulcers in fifteen out of sixteen cases. Lewin confirms this, but Guttman was unable to do so in two cases.

Ziehl (27) has obtained positive results in seventy-three cases of undoubted phthisis; he found no bacilli in thirty-four cases of other lung disease. He thinks it more likely that

there is no other "fungous-form" in nature to be stained thus, than that the tubercle-bacillus is the only one which is stained slowly in Fuchsine and Methylene-blue. He considers the observation of the bacillus a certain means of diagnosis of the tuberculous process and a method of differentiation from other forms of disease; but their absence must not be considered as excluding tuberculosis. He speaks with especial certainty upon the prognostic value of the numbers of the bacilli in the excretions.

Rosenstein (28) found the bacillus in the urine of a patient with symptoms of tuberculous disease of the epididymis—the lungs being perfectly free. Lichtheim detected the bacillus, post mortem, in the contents of the pelvis of the kidney in a case of renal tuberculosis.

West's (29) conclusions, after the examination of fifty cases of phthisis, are: I. That bacilli are found in all cases of phthisis with excavations, varying in number with the rapidity of the destructive process; II. That their arrangement in groups and masses indicates a greater amount of destruction of the lung tissue, unless the isolated bacilli are in great numbers; III. That there is no variation in the size of the bacilli; IV. That the bacillus being evidence of the destruction of lung tissue may be confirmatory diagnostic evidence, although he has only found them after the physical signs were clear.

Williams (30) found bacilli in one hundred and six out of one hundred and nine cases of phthisis. Of the remaining three—in one, but one examination was made; in another, the excretion seemed to be purely bronchial; and in the third, the slides were spoiled and he could get no more. He considers it hardly justifiable to draw any conclusions from the activity of the disease and the number of the bacilli—although as a rule they are few in the cases in which the disease is quiescent.

Dreschfeld (26) found bacilli in varying numbers in forty-

six cases of positive lung-tuberculosis; in two or three doubtful cases; and none in eight non-tuberculous lung affections. He considers them of diagnostic but not of prognostic value.

Dettweiler and Meissen (31), after the examination of eighty-seven cases of phthisis, conclude that the number of the bacilli in the sputum has no bearing upon the prognosis. An observation which they have confirmed by a series of parallel records—clinical and of the number of the bacilli in the sputum.

Spina (32) asserts that there are other bacilli with the same staining reaction as the tubercle-bacillus, and that he can find no other means of differentiation; that he could not find Koch's bacillus in tuberculous organs that had not been for a certain time exposed to the air; and that Koch's results are inconclusive, on the ground of too few experiments.

Immediately after Spina's work was published, Koch's(33) reply to his critics appeared. His article is characterized by vigor and by an evident security in the position he took at the start upon the merits of his discovery.

He first turns his attention to America, and merely mentions Cutter(34), who considers the bacillus to be "embryonal forms of mycoderma aceti." Of Rollin Gregg (35), who suggests that the bacillus may be only fibrine filaments, Koch says he seems to have considered that microscopical investigations would be superfluous for the establishment of his views. Schmidt (11) is advised to get good colors and learn how to use them before announcing fat crystals as bacilli. Formad (8) is told to become sufficiently expert not to let his animals die of tuberculosis when inoculated with wood, glass, metal, &c. Sternberg's (36) failure to find the bacillus puts him out of court.

Then turning to Germany, he remarks that "if one thinks that Germany cannot bring forth such blossoms of tubercle

literature as these, he is much mistaken." He says that Beneke (37) must have found fat crystals and not bacilli in the blood of healthy men; that Crämer's twenty cases of bacilli in the stools of healthy men have been contradicted by Menche (24[a]) and Gaffky's (38) experiments, and that they were not identified with the tubercle-bacillus, although they were stained after Ehrlich's method. Balogh (14) found bacilli in Berlin mud, which Koch did not succeed in doing. Koch moreover denies any value to Balogh's inoculation experiments, because no sufficient precautions for the exclusion of the tubercle-bacillus were taken. Schottelius (39) produced anatomical tuberculosis in dogs by causing them to inhale masses of finely-pulverized non-tuberculous matter. Koch says that the anatomical appearances are not the criterion of what is tuberculous, and that Bertheau and Weigart have completely contradicted him. Dettweiler (31) discriminating between phthisis and general tuberculosis, attempts to show that the tubercle-bacillus is the accompaniment and not the cause of tuberculosis. Koch thinks he would change his mind if he knew more about the pathology of tuberculosis. Koch (32) then turns his attention to Spina, and in summing up a criticism of his work—after leaving exposed the fallacy of his reasoning—concludes by saying: "All his work shows that Spina does not know enough to observe bacteria microscopically, nor to cultivate nor to inoculate them. His work will have no influence upon the discovery of the tubercle-bacillus."

Since Koch's article in March, observations have been published by

Demme (40), who thinks he can confirm Lichtheim's observations as to the bacilli in acute miliary tuberculosis. He considers it probable that ulceration is necessary before the bacilli can be seen in the excretions. As an instance of probable infection, he relates the case of a child which was put out to nurse in a family, and whose foster-father

died of acute phthisis. The child had not the slightest hereditary taint of phthisis or of syphilis, and was infected through the nasal mucous membrane. After suffering from ulcerative ozœna, it developed tubercular meningitis, and died. Tubercle-bacilli were found in the ulcerated and non-ulcerated pituitary membrane.

Purser (41) quotes a case in which the bacilli were discovered in the sputum five weeks before the clinical signs showed any disease of the lungs.

Prudden (42) found bacilli in forty-six out of fifty-eight cases, in simple sputum preparations; and in thirty-nine out of forty-two, of sections. He thinks it is evident that, in nearly every case of tuberculosis, there are many miliary tubercles of all forms, and in many cases, much tuberculous tissue from which the bacilli seem to be entirely absent —which may perhaps be explained by their not staining well after life is gone or going, and perhaps by their having disappeared from tubercle which has come to a standstill.

The longest and clearest work upon the subject of the tubercle-bacillus yet published is that by Mr. W. Watson Cheyne (43). As a preliminary to his work, this gentleman visited the laboratories of Toussaint at Toulouse, and of Koch at Berlin, and observed the methods of work at both places—carrying away material for subsequent experiment and examination.

In his experiments as to the inoculability of tuberculosis he has exercised the greatest possible care to prevent contamination of instruments and hands, and has kept the animals experimented upon under the very best hygienic conditions—this latter a precaution that has not always been taken.

In his inoculation experiments with non-tuberculous material, he obtained negative results in every case. He explains the contradictory results of former observers by:— first, the mistaking of cheesy masses, not tubercular, for tu-

bercle, where a microscopic examination was not made; and, second, by the fact that even where a microscopic examination was made, the accuracy of the diagnosis would depend very greatly upon the methods of staining employed and the views which the observer held as to what constituted a tubercle. It must be remembered also, with regard to the early experiments in this direction, that the danger of mediate inoculation was not recognized, and that therefore the channels for the possible introduction of specific micro-organisms were left unguarded—as the precautions necessary for the thorough disinfection of instruments, etc., had not yet been made out. He failed to obtain tubercle with the material obtained from Toussaint, and explains the latter's results by the growth of tubercle-bacilli in his culture-fluids and their introduction during inoculation. The latter occurrence is rendered more probable because Toussaint trusts so much to disinfection by carbolic acid, which, although effectual against ordinary micro-organisms, has been shown to have no effect upon the spores of other bacilli, unless it acts for a long time. The tubercle-bacillus apparently produces spores, and there is no reason to suppose that these are less resistant than those of bacillus anthracis and other bacilli.

In the researches of Klebs and Schüller, a pure cultivation was not obtained, nor were the cultivations carried beyond the third generation; nor was Schüller always successful in producing tuberculosis by the injection of his cultivations. Not even the best microscopists and those who have done most with micro-organisms (Koch, Weigert, etc.) have been able to find the micrococci which Schüller declares he has seen in artificial tuberculosis. Cheyne has found micrococci only twice, and neither time in tubercle.

The difference between the results of previous researches and Koch's is that his are much the more definite. He, like others, cultivates micro-organisms from tubercle, but

now it is no longer the fact that he only sometimes succeeds in causing tuberculosis, and that the tubercle thus produced occurs as slowly or more slowly than after the inoculation of tuberculous material. The result of the inoculation of his cultivations is certain, and more rapid in its commencement than after the inoculation of tuberculous matter.

As a result of all his work, Cheyne comes decidedly to the conclusion that the tubercle-bacillus is the cause of tuberculosis, and that scrofulous glands, degenerated (strumous) synovial membranes of joints, phthisical lungs—in short, all those materials obtained from man, which, inoculated into animals, produce acute tuberculosis—contain in them bodies (bacilli) which, if they entered the circulation in sufficient numbers, would give rise to acute tuberculosis. It has been demonstrated by several observers that probably in all cases of acute tuberculosis a place can be found where these bacilli get into the circulation.

Cheyne considers the bacilli to be developed in the first instance in epithelioid cells, and that, in the lung, these cells are derived from the alveoli. He thinks that giant cells are epithelioid cells which have grown rapidly—apparently as the result of the presence of bacilli in them. He thinks that the structural definition of a tubercle must run as follows :—

"A nodule, composed of a central mass, consisting in the main of epithelioid cells, or in its place a cheesy mass, surrounded by more or less inflammatory tissue, with or without the presence of giant cells. The absolute diagnostic mark is the presence of the tubercle-bacillus. It is not, however, always necessary for a tubercle to be a nodule. If there are plenty of epithelial cells, or if it occurs when there are no pouches—as there are in the lung—it may be diffuse."

Cheyne then discusses the facts of the varying numbers of the bacilli in phthisis, and draws the conclusions that

according to the number and rapidity of growth of the bacilli we have fibroid phthisis or caseous pneumonia. On this basis can also be explained the difference in the effects produced by these organisms in man and rodents. Rodents which are inoculated subcutaneously always develope general acute tuberculosis, which is extremely rare in man when compared with the frequency of pulmonary tubercle; because in man the bacilli are not inoculated, but are received into the bronchial tubes by inhalation; their entrance into the circulation is prevented in the first place by the inflammatory changes which occur around the alveoli in which the bacilli grow. If man were inoculated as rodents are, analogy makes it probable that acute tuberculosis would be developed.

The papers which have appeared since this publication are few but of great importance.

Ransome (44) has shown bacilli exhaled by a patient suffering from phthisis. He obtained them by condensing the vapor of the breath in a large glass globe surrounded by ice and salt, and stained them by Gibbes' (44[a]) method.

Cornil (45) studied the bacillus in tuberculous granulations as being the most simple lesions. He found generally in the centre of a tuberculous mass a vessel obliterated by fibrin, and bacilli in the centre of this; they were usually present also in the walls of this vessel and near by, in varying numbers. He found that the number and dissemination of the bacilli varies very greatly, and could not find them at all in one case of tubercular meningitis. He found them in the spaces between the epithelial cells (lymph-spaces of Ranvier), and in the connective tissue, and in the protoplasm about the nuclei of the embryonal cells which form tubercle.

Ballagi (46) concludes from his investigations that:—
1.—Koch's bacillus can be separated from other forms of bacilli. 2.—A differential diagnosis from all other organisms

can be reached by their staining reaction (Ehrlich's), and they can be thus separated in the tissues from putrefactive and disease germs (as the bacillus of leprosy). 3.—Putrefactive and other bacteria cannot be isolated by any known special staining method. 4.—The tubercle-bacilli do not occur with regularity in the sputum of persons in the first stages of phthisis (apex catarrh, hæmoptysis). 5.—In the sputum from patients in the advanced or fibroid stages the bacilli can always be found, especially in the form known as galloping consumption, although in no case do their numbers correspond invariably with the height of the fever or the stage of the destructive process. 6.—The tubercle-bacilli can be found in tuberculous organs when the process is not very old (chronisch). 7.—There are no bacilli in the sputum of non-phthisical patients. 8.—Their repeated occurrence is conclusive of the diagnosis. Their absence, however, does not prove the absence of a tuberculous process. 9.—Their number and distribution is of no prognostic value.

Fräntzel (47) has now observed three hundred and eighty cases of phthisis, and followed them up for months. He has examined also eighty cases of other lung disease, and always with negative results. In every one of the cases of phthisis he found bacilli in the sputum, and was often able to make a diagnosis by their presence, when the physical signs were negative—a diagnosis which was invariably confirmed by the further progress of the disease. In five cases which progressed with the picture of phthisis, no tubercle-bacilli were found, and further observation showed that none of them were cases of "cheesy infectious phthisis" (which was confirmed in three by post-mortem examination). These further observations lead him to adhere to the first of the three laws which he enunciated in his former article—that the presence of the bacillus in the sputum determines the presence of tuberculosis. He also considers the

quantity of bacilli—as determined after repeated examinations extending over a long time—as of great prognostic value. (He thinks that the examination should be extended over weeks or months, and should be repeated every day—or at least every second day—with notes and comparisons, and the conclusions to be drawn from the general average.) He thinks that such a long series of observations will give us a more certain prognosis than even the physical signs. As a result of his further study of the subject, he wishes to modify, slightly, his second law, i. e., "that wherever, after repeated and careful examinations, no bacilli are found in the sputum, there is no tuberculosis of the lung." This law would now read as follows :—"When, after repeated and careful examinations, no bacilli are found —provided that sputum is present and comes from the lungs —there is either no lung tuberculosis, or else there are no cheesy softened foci emptying their contents into the bronchi."

At a medical meeting in Vienna, on May 13th, Spina (48) read a paper on the subject of Koch's bacillus. It was especially devoted to the discussion of its behavior towards staining fluids, and he still denies any specific property to it. He gives no further inoculation or cultivation experiments, and bases his rejection of Koch's theory especially upon the fact that the bacilli are found to act differently toward staining fluids than it was at first announced they did.

In proof of the presence of other organisms having the same staining reaction, he gives the results of Dr. Matray's work, which is as follows :—

1. Micro-organisms of many kinds, especially staff-shaped bacteria, cocci singly and in colonies, leptothrix and torula forms, were stained blue on a brown ground : *a*, in bronchiectic sputum ; *b*, in sputum of bronchial asthma ; *c*, in sputum of diffuse bronchitis (every time in 94 preparations) ; *d*, in the "furred tongue" of non-phthisical patients

(eleven cases with 28 preparations); *e*, in the lochia of non-phthisical lying-in-women (twelve cases with 43 preparations); *f*, in the sputum of fourteen cases of pneumonia (46 preparations); *g*, in the stools of a typhus fever patient; *h*, in the expressed fluid of a case dead of malignant œdema.

2. Bacilli in form, size, grouping and reaction like the tubercle-bacilli were seen: *a*, in the sputum of a case of bronchiectasis (in 54 preparations); *b*, in the furred-tongue secretion of sick and well persons (eleven cases, 28 preparations); *c*, in the stools of a typhus-fever patient (every time in 16 preparations); *d*, in the sputum of a case of bronchial asthma (every time in 34 preparations); *e*, in the sputum of a case of diffuse bronchitis (6 preparations); *f*, in the lochia of a healthy lying-in woman (2 preparations); *g*, in a case of croupous pneumonia (4 preparations).

He quotes Kaberhel and Matray (assistants assigned to him by Stricker) as concluding that, "on the one hand, micro-organisms which do not differ from the tubercle-bacillus react to staining fluids as do these bacilli; and on the other hand, that Koch's bacilli react to staining fluids exactly as do other micro-organisms."

He also quotes, as a point against the specific nature of the tubercle-bacillus, the recent observation of a bacillus similar to these in several cases of lupus.

Stricker himself addressed this meeting in support of Spina and his methods.

Klebs (49) as the result of his more recent work, gives the following summary:—

1. The tuberculous process is caused by organisms, as was first shown by me, and rendered certain by R. Koch.

2. I have not come to the same results as Koch in regard to the morphological relations of the tuberculous organism. On the one hand, I must hold fast to the fact that

finely granular micrococci are present in the albumen cultures, as well as in the youngest form of inoculated tubercle. On the other hand, I am in no way meaning to assert that Koch's bacilli are unessential impurities. They appear to represent an essential stage of development of the tubercle organism for the further development of tuberculosis, if they are not always present.

3. In regard to the history of the development of tuberculosis, I think that I have presented the proof that:

(a) The development of the tuberculous process begins very soon after the inoculation, and not after from 10 to 14 days, as Cohnheim and others believe. The difference depends, not upon an error of these last investigators, but upon the nature of the changes, which are to be regarded as the first stage of the tuberculous process. Completely formed tubercles, which can be distinguished with the unaided eye, appear in fact only after the longer period. But before the appearance of these, there are already extensive cellular deposits present in places which are at a great distance from the place of inoculation (mesentery). These represent perivascular infiltrations which are either developed further to the known form of tubercles, or can retrograde in the different stages of their development (cheesy nodules, either with or without contracting cicatrization, adhesive and deforming forms of peritonitis).

(b) The same primary method of distribution is also found in human tuberculosis, in which also the traces of these retrogressive formations in the mesentery and omentum are found in cases of pulmonary tuberculosis. In other cases, on the contrary, a further development of this form of tuberculous invasion comes on, which leads to the formation of cheesy foci in the organs, which are only related by means of the blood-vessels with the point of entrance of the tubercular virus into the organism (cheesy foci of the bones, the central nerve-apparatus, etc.).

The work which I have done upon this subject has been for the purpose of identifying the bacillus, and determining the frequency of its occurrence in tuberculous lesions. The organs examined have been lungs, liver, spleen, kidney, peritoneum, bronchial, mesenteric and inguinal glands, pia mater and the eye. In all of these bacilli have been found in varying numbers. They are less numerous in old, or slow, processes; very abundant in rapid ones, and especially so in the cavities filled with cheesy material. They are found in the swollen epithelioid cells of tubercle, or lying between them—singly, or in groups of from two to a dozen or more. They very frequently seem to be divided into a series of dots, from four to six in number, which occupy the body of the staff, and are taken to be spores. The result of my observation is confirmatory proof of the existence of the bacilli, and of Cheyne's proposition that their presence is diagnostic of tubercle. The difficulty with which they have been demonstrated in some cases, and the care required to obtain the desired result, seem to explain some of the failures in this direction. Nothing less than a $\frac{1}{12}$ Zeiss objective, together with an Abbé's illuminator, is sufficient for the perfect examination of a section. All my observations have been made with this apparatus, and a No. 3 eye-piece. All the sections have been made with a Jung microtome. Upon several occasions the bacilli have been observed in the blood-vessels, which would seem to show one method of auto-infection—the lymph-channels undoubtedly furnish another. I have seen a bacillus lying half in, half out of a swollen cell, its presence seeming to have acted as an irritant upon this special cell element. I have never seen anything but the bacillus staining red on a blue ground—although there have been plenty of other organisms which were stained blue.

The method of staining employed has been practically that of Ehrlich, which has seemed to give the most satisfactory results. It is as follows:

For sputum:—The cover-glasses are spread with a thin layer, taken from the more solid portion of the specimen, using fired platinum needles for its distribution. They are then dried carefully over the flame of an alcohol lamp, and after drying are passed two or three times through the flame itself. They are then placed in a solution of Fuchsine B. and aniline oil—one gramme of the first to fifty grammes of the second. The latter is made by shaking a few drops of aniline oil with distilled water and filtering. The specimens are allowed to stand in this solution for twenty-four hours. They are then washed and placed in a solution of one part of nitric acid (C. P.) and two parts of distilled water, and allowed to remain until they are completely decolorized, or until at the most a pinkish hue is all that is left visible to the eye. All the acid is then removed by repeated washing in distilled water, and the specimens are placed in a saturated watery solution of methyline-blue and allowed to remain for from five to eight minutes. The superfluous staining-fluid is then removed by repeated washing, the specimens are carefully dried as before, and are finally mounted in Canada balsam and examined.

For the tissues a similar method was pursued, except with the differences made necessary by their nature. Before placing in the Fuchsine solution, the alcohol should be removed by thorough washing, and the reagents should be allowed to act for a longer time, more especially when the sections are thick or the specimens are old. After staining in methyline-blue, they should be washed, dehydrated in alcohol, cleared up in oil of cloves, and mounted in Canada balsam.

The following is a complete record of the examinations I have made of different organs for the detection of the bacilli:

No. I.—A guinea-pig inoculated in the groin with a few drops of tuberculous sputum, in December, 1882; died in the middle of January, 1883.

Sections were prepared from the liver, spleen and peritoneum,—the lungs were healthy.

No bacilli were found in the sections of the liver.

The spleen showed bacilli singly in the tissues and in the swollen epithelial cells.

The peritoneum containd bacilli in the miliary nodules, about the edges, and in the centre of the tuberculous mass.

No. II.—A guinea-pig inoculated in the same manner as the preceding; died January 13, 1883.

No changes in any organ but in the liver.

Slides from this showed the bacilli in numerous places in and near the tuberculous portion, which was in the form of infiltration, rather than of nodules. The general position of the bacilli was in the lymphoid cells, and rather in the region of the portal vein.

No. III.—A guinea-pig inoculated as the preceding, in December, 1882; died in March, 1883.

The lungs presented no abnormal appearances.

The spleen showed plenty of evidence of degeneration, and bacilli were found in numbers in the cells and lying free in the tissues.

The liver and an enlarged inguinal gland were examined, with negative results.

No. IV.—A guinea-pig inoculated on March 13, with a few drops of tuberculous sputum (from Case IV.); the syringe was inserted in the left inguinal region just under the skin. Died in ten days.

All the organs gave negative results, except in the spleen, where, with no changes visible to the naked eye, a number of bacilli were found in and near the finer blood-vessels.

The cellular tissue at the point of inoculation was found to be stuffed with bacilli, lying in and between the much swollen cells, and in immense numbers.

No. V.—A guinea-pig inoculated in the same manner as the first three, in December, 1882; died, after progressive emaciation, on April 2, 1883.

All the organs showed tubercular infiltration, and sections under the microscope showed bacilli in the lungs, liver, spleen, kidney, inguinal glands, and skin under the point of inoculation.

No. VI.—A guinea-pig inoculated in the eye, in December, 1882; died April 15, 1883.

The lungs, liver and glands showed signs of disease.

The bacilli were found in plenty in the giant cells and the alveolar walls of the infected portion of the lungs, and in smaller numbers in the cells and lying free at the edges of the tuberculous deposit in the liver. They were also found in the gland examined.

No. VII.—A child of 3½ years, died of acute miliary tuberculosis.

Sections from the lung, liver and mesenteric gland showed bacilli very distinctly. Slides from the liver and peritoneum were unsuccessfully mounted and gave negative results.

No. VIII.—A cheesy bronchial gland, removed three months before examination, and preserved in absolute alcohol.

Bacilli were found in plenty in the cheesy portions near their edges; fewer in the degenerated parts, and scattered through the comparatively healthy tissue beyond.

No. IX.—A case of acute miliary tuberculosis in a child.

Sections from a peritoneal gland and the liver gave negative results; there was no tuberculous infiltration on the slides prepared.

The sections from the kidney contained very little tuberculous infiltration. Bacilli were noticed in small numbers in the region of the straight tubules, and a few in the interior of swollen Malpighian bodies.

The omentum contained occasional masses of bacilli, with numbers of isolated staffs in the infiltrated tissue.

No. X.—A specimen marked "Gland from Autopsy."

But two slides were prepared from it, and gave no evidence of the presence of bacilli.

The specimen was very old, and had no attainable history; it may therefore be fairly rejected as evidence.

No. XI.—Tuberculosis of lung.

A specimen of very old fibroid phthisis. The tissue under examination was almost all cicatricial, and nothing was seen that could be distinctly made out as the bacillus.

No. XII.—Tuberculosis of peritoneum.

The nodules were extremely fine and widely separated, and a section of one was not obtained. Bacilli were seen, however, in small numbers, lying singly in the tissues where the presence of swollen cells indicated the neighborhood of the tuberculous process.

No. XIII.—This was a specimen sent in as a "Cheesy Mesenteric Gland," from a case in which death was caused by the perforation of an ulcer of the intestine into the peritoneal cavity and the subsequent peritonitis.

There was no tuberculous disease of the gland at all, and bacilli were not found.

No. XIV.—Contents of a cheesy cavity from the lung of a rapidly fatal case of tuberculosis.

Bacilli were found in immense numbers; in some cases the cells seemed to be stuffed with them, and most of them showed a well marked division into spores.

No. XV.—Scrapings from the wall of a lung cavity in an ordinary case of phthisis.

Bacilli in immense numbers. In some places the whole field filled with them.

No. XVI.—Contents of a lung cavity in a case of slow tuberculosis.

Bacilli in immense numbers, in masses and singly, and presenting well-marked divisions into spores.

No. XVII.—Cheesy cervical gland.

Largely made up of fibrous material, with a few small cheesy foci. Bacilli were found in the edges of these portions in clumps and singly, and in the few giant cells that were seen.

No. XVIII.—Case of tubercular meningitis; dead after a month's illness.

A much enlarged bronchial gland was found, and the pia mater was full of minute granulations.

Bacilli were found scattered about near the edges of the tubercular portion of the gland, with many spores.

Sections of the pia mater showed very fine bacilli, with many spores—their situation being, in general, in the neighborhood of the finer blood-vessels and the lymph spaces. The origin of infection in this case was very evidently the enlarged gland.

No. XIX.—Tuberculous lung.

This specimen was a mass of tubercle, with cheesy foci and cavities.

The bacilli were found in the edges of the cheesy mass—in some instances in its centre. There were many spores, and occasionally bacilli were seen in what was apparently healthy tissue.

No. XX.—Tuberculous lung.

This, like the preceding, was a mass of tubercle, with many cheesy foci and much cicatricial tissue.

Bacilli were found, in not very large numbers, near the edges of the more recent degenerations; in much less abundance in the old fibrous portions.

No. XXI.—Tuberculosis of kidney.

Bacilli were found in plenty in the contents of a small cavity in the cortex of the kidney, and in the tissue from a nodule near by.

This case had been diagnosticated during life as a perinephritic abscess, and a drainage tube had been inserted for almost a year.

No. XXII.—Tuberculosis of eye.

This specimen was removed last fall, and had been preserved in chromic acid.

It was only after two attempts, and staining prolonged for

forty-eight hours, that a few bacilli were discovered in the nodule.

No. XXIII.—Acute miliary tuberculosis in a child.

Bacilli were found in large numbers in the cells in the tuberculous portions of the spleen, of an enlarged cheesy mesenteric gland, and in a tuberculous ulceration of the intestine.

As a result it will be seen that in every case of inoculation tuberculosis was devoloped, and the microscope revealed the bacillus in some portion of the organs of the animals experimented upon. There are a number of guinea-pigs still under observation. I was able to trace the bacilli with increasing certainty as practice trained my eye for their definition in the tissues. I have found a marked difference in the apparent size of these organisms in the sections examined. In some specimens they appear very fine and delicate—almost indistinguishable—sometimes only a line of dots being visible: in most cases they are exceedingly distinct and well-marked. However, as they are always of the same size and appearance in the preparations of fluid matter, and as those which appear to be finer and more delicate seem to fade quicker, I am led to believe that the apparent variations in size are due to optical effects from imperfect staining. Some observers obtained their results in the examination of tuberculous tissue by grinding a tubercle in a mortar with water, and drying the resultant mass upon cover-glasses in the manner of sputum preparations. The ease of this method is more to be commended than its accuracy—for in an examination of this kind every source of error should be eliminated that it is possible to get rid of.

In February last I began a series of observations of the sputum of a set of phthisical patients—all known to be so by the physical signs. These observations have been continued up to

very recently, and the results obtained in five represented in a diagrammatic manner upon the charts. The upper curve represents the temperature of the day of the examination—the lower, the number of bacilli. The examinations have been made at average intervals of a week. The results of the examinations of the sputum are here given in detail.

CASE I.—Sick for three years—hæmoptysis the first symptom.

Thirteen examinations of the sputum were made, with positive results in eleven. The number of bacilli varied from none at all to very numerous. The results are condensed on Chart I.

CASE II. — Sick for one year — hæmoptysis the first symptom.

From February 17 to June 3, fourteen examinations were made, with positive results in thirteen. When bacilli were found at all, they always occurred in large numbers. (Vide Chart II.)

CASE III.—Cough for six months. Gained weight while under observation, and was finally discharged relieved.

From February 17 to April 20, eleven examinations were made, with positive results in six. For five successive examinations no bacilli were seen, and they never occurred in large numbers.

CASE IV.—Cough for eight months.

From February 17 to April 20, ten examinations were made, with positive results in nine. The number of bacilli varied very greatly, and the results are tabulated on Chart IV.

CASE V.—Sick for seven years.

From February 17 to June 3, fifteen examinations of the sputum were made, with positive results in nine; the bacilli always occurred in very small numbers. (Chart V.)

CASE VI.—Sick for three years—hæmoptysis the first sign.

From February 17 to June 6, there were fifteen exami-

nations of the sputum, with positive results in twelve. The bacilli were always very few until the last examination, when the number observed increased very greatly, but with no corresponding increase in the temperature. For three months this patient's temperature has been sub-normal much of the time. (Chart VI.)

CASE VII.—Sick one year—hæmoptysis the first sign.

From April 20 to June 3, four examinations were made, and very many bacilli were found in every case. This patient's temperature curve was pretty constantly high.

CASE VIII.—Cough for one year.

From May 19 to June 3, three examinations were made, with bacilli in diminishing numbers; the temperature upon the days of the examinations being less each time also.

CASE IX.—Cough for two years.

From May 19 to June 3, three examinations were made, with very many bacilli in every case. The temperature, however, showed no exact correspondence.

CASE X.—Cough and hæmoptysis for ten years.

From February 17 to June 3, fifteen examinations were made, with positive results in six only—and in these the bacilli were always seen in but very small numbers. The temperature of this patient has been for weeks at a time within half a degree of normal.

CASE XI.—This was a case of pleurisy which was examined for comparison.

From March 14 to May 19, seven examinations were made, with negative results in every case.

A comparison of the charts tends to show that there is only a very general correspondence between the numbers of the bacilli and the height or variations of the fever line. A large number of bacilli does not necessarily mean a high temperature. The fever curve of each patient varies somewhat, and has a general average of its own, sometimes a very high one and sometimes entirely the opposite. It is

with this average range of temperature in the special case, that the number of the bacilli must be compared; and it is only by this observation of special cases that the information obtained is of value. It is also shown that a continued examination of the sputum for weeks at a time may be necessary before the absence of the bacilli can be definitely assumed—as is shown in Case V., where six successive examinations were made before they were detected. In rapid cases, with free expectoration, there are enormous numbers of the bacilli to be found. The characteristics of the sputum also seem to be something of a guide to the number of bacilli that one may expect to find. If it is largely mucous, with but a few yellowish nodules in it, bacilli will only be found in these nodules; and then, possibly, only in small numbers. If, however, the sputum be of a more purulent fluid character, the bacilli will probably be present in great numbers, whatever portion is examined.

The result of all the work that has been done upon this subject may be summed up as follows:

I.—A staff-shaped micro-organism exists, in all forms of the tuberculous process, and its presence has been demonstrated in them.

II.—It is more abundant in the rapid than in the slow forms of the process.

III.—Its specific nature as the cause of tuberculosis is claimed by Koch on the ground of his observations.

IV.—Its specific character has not been successfully refuted by trustworthy observations.

V.—Its value as diagnostic evidence of tuberculosis is very great; although its absence cannot be considered as excluding that process.

The only observer who has thus far attempted the repetition of Koch's cultivation experiments, is Prof. Feltz (50), of Nancy, who has announced the complete failure of his

work. The manipulation is such, however, that more than one failure must occur to upset the testimony of complete and repeated successes.

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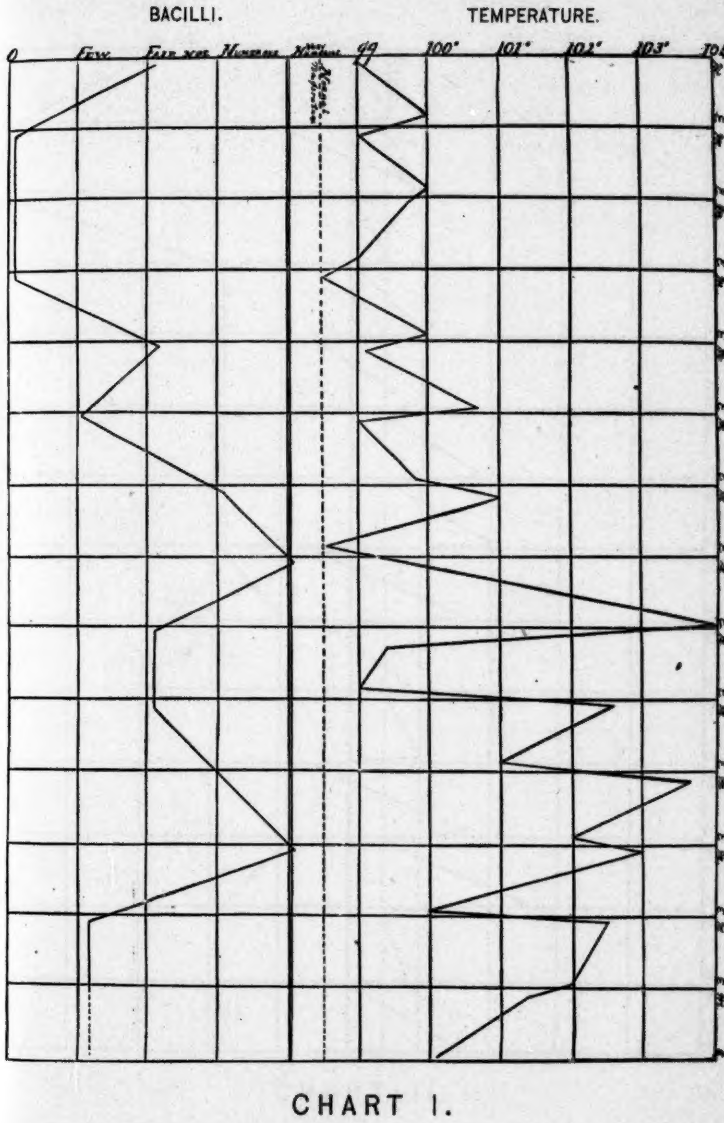
CHARTS.

The upper curve represents the temperature on the day of the examination.

The lower curve is a diagrammatic representation of the number of the bacilli found at each examination.



BACILLI.
TEMPERATURE.
0
Few.
Fair no.
Numerous
99
100°
101°
102°
103°
104

CHART I.

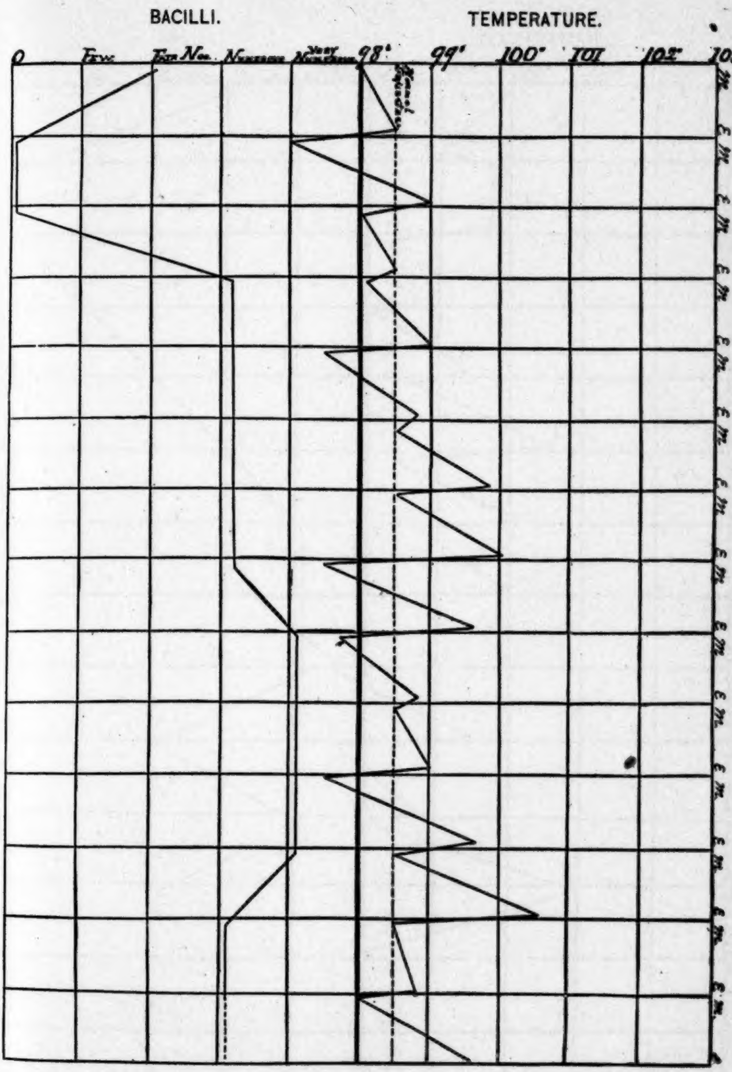

BACILLI.
TEMPERATURE.
0
Few
Numerous
Very Numerous
98°
99°
100°
101
102°
103°

CHART II.

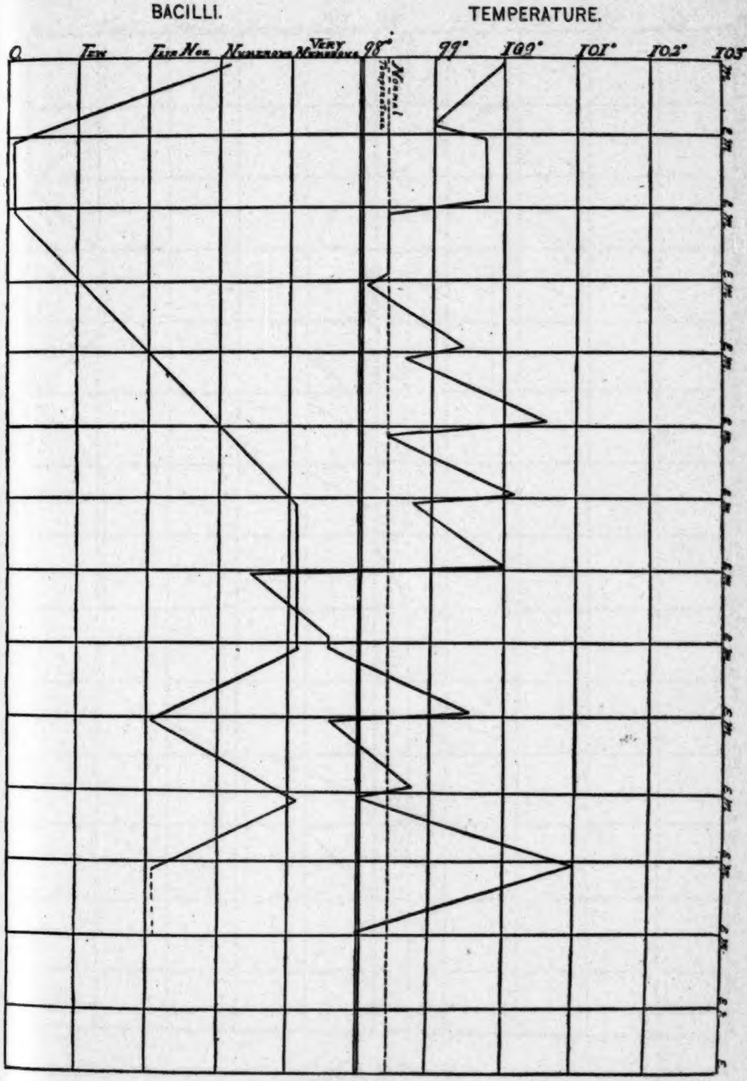

BACILLI.
TEMPERATURE.
0
Few
Few No.
Numerous
Very Numerous
98°
99°
100°
101°
102°
103°
Normal Temperature

CHART IV.

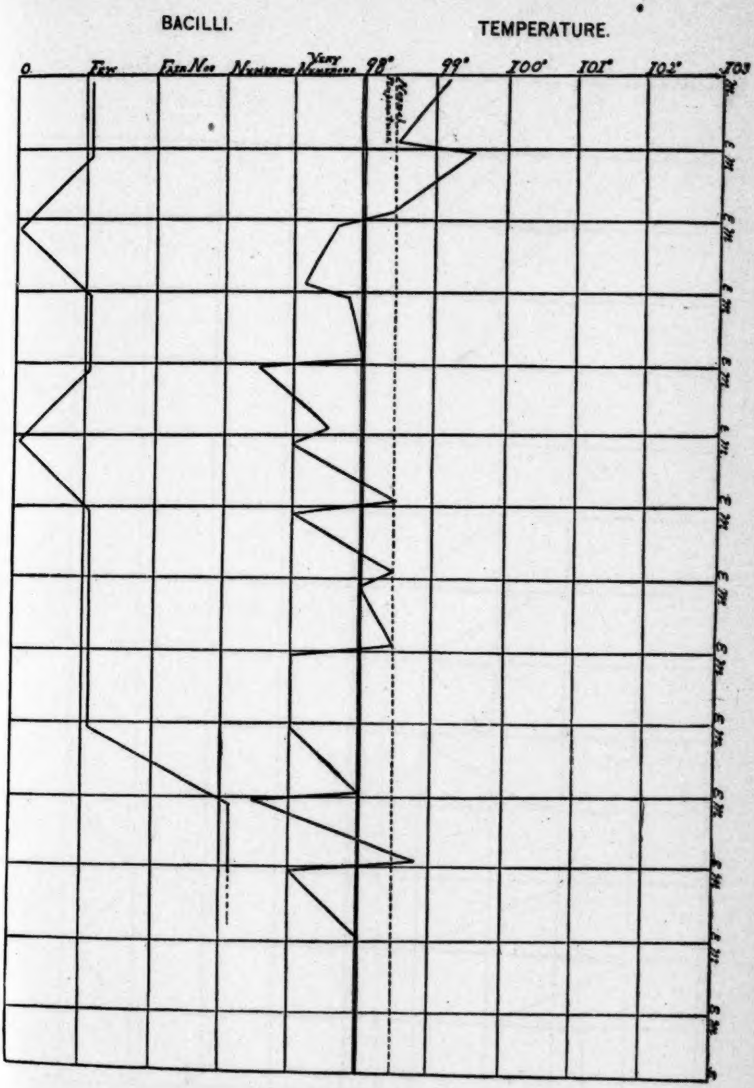

BACILLI.
TEMPERATURE.
0.
Few
Fair No.
Numerous
Very Numerous
98°
99°
100°
101°
102°
103

CHART V.

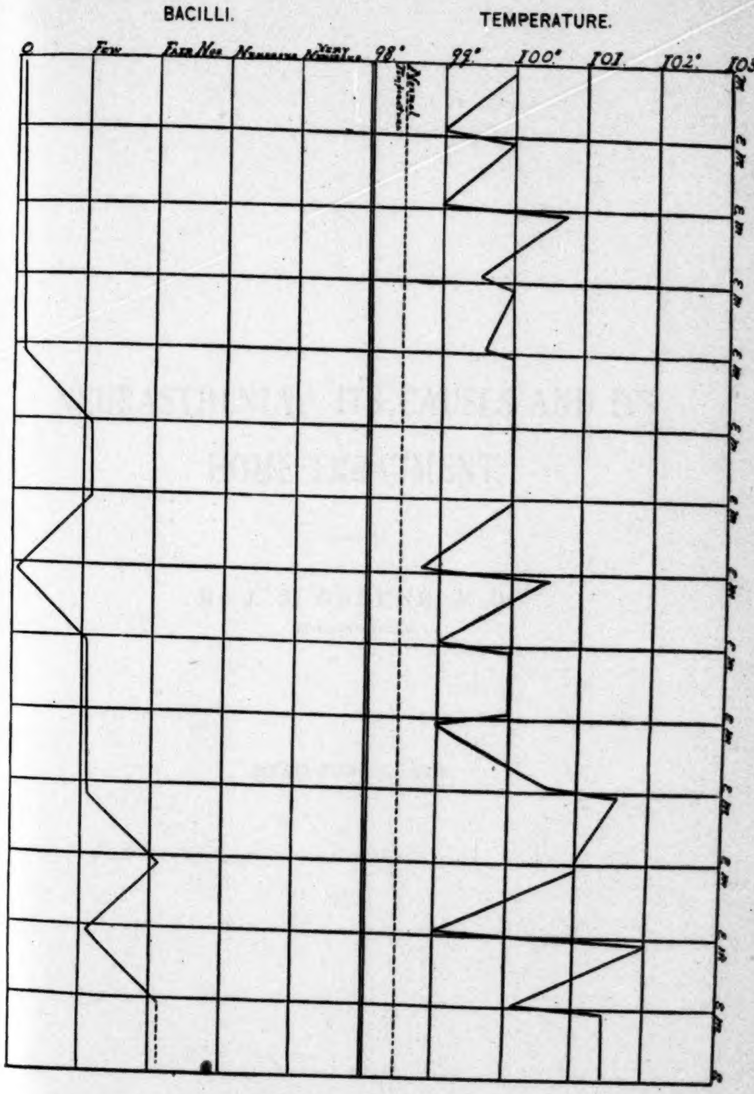


CHART VI.

NEURASTHENIA; ITS CAUSES AND ITS HOME TREATMENT.

By J. S. GREENE, M.D.
OF DORCHESTER.

READ JUNE 13, 1883.

NEURASTHENIA; ITS CAUSES AND ITS HOME TREATMENT.

THE word Neurasthenia is here taken, not attempting an accurate definition, to signify that state of exhaustion, reduction, or suspension of available nerve power popularly known as nervous prostration. It is scarcely necessary to add that this is a condition entirely distinct from anæmia, and also from hysteria, though these diseases may be associated with it, and are possibly sometimes mistaken for it.

In the discussion which followed the reading of a paper on "Subinvolution of the Uterus and Neurasthenia," before the Boston Society for Medical Observation, about two years ago, Dr. Weir Mitchell said that he preferred to use the term nervous exhaustibility rather than nervous exhaustion. The distinction is obviously a valuable one, but the latter term has a convenience and fitness if used simply as the expression of the ultimate condition whereof the liability or predisposition is signified by the former. In the remarks which follow both terms will be made use of, according to these their primary and natural meanings. It is not only convenient but necessary, in pursuing my subject, to give to the term nervous exhaustibility a wider significance than did the distinguished authority whom I have quoted.

I take this postulate: that it is nervous debility or nervous exhaustion, nerve-tire or neurasthenia, interchangeable terms, or terms standing for varying degrees of nervous disability, with which we as physicians are confronted in individual

patients; while nervous exhaustibility is a characteristic of the age in which we live, and of which we as social scientists and medical philosophers must take account.

I believe that the nervous exhaustibility of the present day has its origin in the immense uprising of mental activity produced by those supreme factors in modern civilization, free schools and a popular press.

When we contemplate the astonishing inventions and discoveries which characterize the age, each in turn eclipsing its predecessors, and each powerfully helping to complicate the maze and impel the dizzying whirl of human activities, we cannot wonder at the evidences of over-tension and the increasing proportion of those who have to pause by the way. The one set of facts is the inevitable and logical complement and accompaniment of the other, and both are directly traceable to the invention of printing.

It seems as if humanity in this age of the world is reaching the end of its tether; that it is putting into action all its capacity, leaving nothing in reserve. The men and women of to-day and their successors, far more than those of former times, are feeling, or are destined to feel, the limitations of their power to do.

A statement of modern tendencies may be formulated thus:

Firstly: Immense increase and general diffusion of knowledge and rapid inter-communication awaken dormant energies, develop latent capacities, quicken mental activities, and there results nervous exhaustibility. So far all is normal and legitimate.

Secondly: Activity incites to ambition, emulation, competition, hurrying and striving, and there results tension of faculties and super activity. Here the danger line is reached.

Thirdly: Hurry and competition bring over burden of responsibilities, cares, anxieties, jealousies, distractions, and these are the chief immediate causes of nervous exhaustion.

I necessarily omit from this discussion a class of cases

much fewer in number than those with which we chiefly have to deal,—a class where idleness, lack of occupation and of definite purpose are commonly associated with habits of emotional excitement from reading trashy, sensational literature and with practices of vicious self-indulgence. I am not dealing here with the vices, but with the honest errors and natural tendencies which our age has especially developed.

The influences which lead to nervous exhaustion are all-pervasive. They permeate the atmosphere of our modern civilization as bacteria do the air we breathe. We are all to a greater or less degree impressible by them; but, like the living microscopic germs, they make their easiest victims of those whose powers of resistance are weakest. It is not effort, it is struggling and striving; it is not business, it is competition; it is not education, it is cramming; it is not social pleasures, it is social emulations and envyings; it is not over-heated rooms and ill-ventilated houses, it is living on too large a scale; in fine, it is not work, it is *worry* that is sapping the energies of our people.

Now starting from the broad postulate here taken, many would reason, as many in fact do reason from a much narrower premise, that the case is well nigh hopeless for the coming generations of Anglo-Saxon stock. I am not of these pessimists. I do not expect that the race is to die out because it has not fully recognized its limitations, any more than I believe that modern civilization is to be given up to anarchy because it contains aspiring elements which ferment and upheave when confined by tyranny. It is possible that the Anglo-Saxon race in America, being foremost in development and therefore first to experience the limitations of human capacity, will also be first to appreciate the risks and to perceive and apply the correctives; will instruct by their example the slower moving peoples as they, in their turn, approach the danger line. With the poison may be found the antidote.

Nor am I of those who think that this whole matter is to be settled by comparisons of columns of figures, and disposed of as a question of vital statistics. It is mainly perhaps a question of mental quality, a something that the census-taker does not reach. No one can assert that mental power is cut down, that the will which dominates the world is weakened, because the nerves, the medium through which mind moves in its material investment, have sometimes to relax their tyranny over the flesh. Indeed it may be that the evil which we are discussing is less serious in its ultimate issue than its present manifestations threaten; inasmuch as it may be in considerable degree a conservative provision, destined to restrain, and thereby to maintain and transmit the forces which shall hereafter lead in the onward march of humanity.

In the mean time, in all the grades of neurasthenia, the one practical issue is *adjustment;*—adjustment of the race to its present environments,—adjustment of the individual to his and her present limitations; and this eminently practical issue is every where, with very rare exceptions, a practicable one. I say then that nervous exhaustibility, as a prominent characteristic of modern life, is the natural and legitimate concomitant of the rapid diffusion of intelligence and evolution of ideas; while nervous debility or exhaustion is the untoward result of a failure on the part of the individual, through his own mistakes conjoined to the errors of his progenitors and guides, to properly adjust his activities to his capacities.

It will serve my present purpose to very briefly indicate some of these special errors which may be called errors of mal-adjustment. And first there are ante-natal influences. The parents have the nervous temperament with the possibilities of nervous exhaustion written on every lineament, with probably the tracings of care and fatigue visible beside. The bride has assuredly wearied herself to the last degree

with preparing the bridal trousseau and with calls and entertainments and excitements; while the bridegroom, with his own late hours at business or dissipation, has very possibly smoked six or eight cigars a day. Then perhaps during the fatigues of a wedding journey, and certainly in the midst of a tumult of social excitements and domestic cares, and of anxieties, not the least of which is the dread of offspring, begins under protest, to the horror and dismay of its progenitors, after numerous postponements secured at the cost of special aggravations of nerve function,—begins the new human being.

Without particularizing minutely the progress of this life thus inauspiciously started, there is one other interesting fact of ante-natal influence to take note of. The woman, convinced sorely against her will that she is to become a mother, proceeds to despoil herself of energy after a new fashion. Whereas until now she has worn and wasted her strength in striving to do, henceforth during the term of her pregnancy she will continue the spoliation by striving to *be*,—not therefore, however, omitting the doing. Besides continuing all her wonted activities, she now undertakes unselfishly, for the welfare of the unborn child, to become a saint. She disciplines herself to equanimity and cheerfulness; suppresses feelings of irritability or despondency; resists all temptations to tearfulness; makes herself a very female Mark Tapley for being jolly under adverse circumstances. In this constant effort of will to control emotional manifestations, which are the natural relief of over-tension, she maintains and increases the tension at the expense of her own strength and the vitality of her offspring. In making herself a saint, she becomes also a martyr, to a mistaken idea of duty.

In proceeding with the subject, it is necessary to remark that the influences acting upon the child and youth are mainly calculated to develop and enhance the nervous excitability implanted in its constitution. These influences can barely be suggested here.

The graded system in the public schools, with the tests for promotion from class to class found solely in percentages of success in repeating from text books, combined with the large increase in the number of branches required to be studied, and in the number of examinations to be undergone, makes the period of school life, in our day, a period of continuous strain and worry which inevitably results in over tension. Likewise at home the child is introduced to the excitements of society from the tenderest years. The *boy* is still extant and flourishes under some difficulties; but of what was formerly known as the *girl* there are at present but few living specimens. She is absorbed and merged into the young lady. This young lady, not having had the opportunity to pass gradually from girlhood into womanhood, but having sprung into womanhood from childhood, with almost the celerity with which Venus rose from the sea, brings of organs and functions especially appertaining to womanhood such ill-conditioned equipment that her poor nerves, whether exhausted or not, must be perpetually hampered and fretted, perhaps bullied and half-starved.

Now having instanced some of the most noteworthy among the special exciting causes of neurasthenia, we come to consider its treatment. As already remarked, the successful management of these cases consists in adjusting the patient to the situation;—still better, in aiding and indoctrinating the patient in the principles and practice of self-adjustment. The patient cannot advance in this without the constant supervision of the physician; nor can the physician succeed without the intelligent and docile coöperation of the patient. Happily this is generally attainable, since the sufferers are usually quite capable of following a train of reasoning to its logical conclusions, and shaping their course of action consistently thereupon. With many their whole scheme of life has been laid upon an impracticable foundation; yet from childhood they have adhered to it heroically in conse-

quence of erroneous teaching, and a mistaken estimate of duty. With such the remoulding of life to a new shape is slow and the work of time. Conviction comes by degrees, precept and doctrine serving as the interpreters of the lessons of stern experience. The physician himself must study with attention each individual case, and patiently form and adopt a plan of management. He will often have occasion to modify this plan to conform to a corrected estimate of the situation, or the powers and qualities of the patient; and the patient should understand this. The physician may often resort to illustrations to enforce his views, and to make clear the situation and the requirements of the case. The patient may be likened to a bank whose specie reserve has been dangerously reduced, and which must contract its business until its reserve is made good; or to a spendthrift, who has squandered his inheritance; or to a merchant, who has expanded his business beyond what his capital justifies, until he comes to the verge of bankruptcy. The one must collect promptly and shorten his credits, and otherwise gradually but steadily and resolutely restore his business to a safer basis; the other must rigidly limit his expenditure until it is sufficiently within his lessened income, with a margin for emergencies.

It may be explained that to have available strength for every day use always implies the possession of a reserve fund of latent strength lying unseen and dormant like the specie in the vaults of a sound back; that when, by continuous overdrafts, this reserve has been greatly impaired, more or less continuous but surely prolonged repose must be had, without expenditure of nerve power until the nerve centres shall have regained a margin of force without which there cannot be healthful activity. When patients reproach themselves for nervousness, inefficiency and lack of self-control, and propose to exercise more will and put forth stronger effort, they may be reproached for thinking to further compel

by whip and spur the tired, jaded steed which has only too willingly and too patiently borne both burden and abuse.

I object empathically to patients comparing themselves with others, and repining because they cannot accomplish as much as their neighbor. They need to be taught, as Thomas Carlyle says in Sartor Resartus, that "The fraction of life can be increased in value not so much by increasing your numerator as by lessening your denominator."

Very often, in the home treatment of cases of neurasthenia, some member of the family needs to be dealt with, the husband, perhaps, or the wife or the mother, and made to see the situation in its true aspect, to secure a necessary element of coöperative influence. Infelicities of expression and inconsiderate allusions are sometimes the precious prerogatives of a well meaning and well beloved one which cannot be taken away without undue violence, and are harder to neutralize than the spiteful shafts of intentional unkindness. Thus the patient and the environments must be mutually adapted, and a wholesome mental attitude and moral atmosphere of cheerful tranquillity and patient, persistent hopefulness secured. When this is assured we may feel confident of success in due time. I would discountenance all attempts, however, on the part of the patient to have a time fixed in advance when recovery shall be complete, or even when certain recognized stages or indications of progress shall be reached. Sufficient for the patient that the earliest signs of actual improvement be pointed out by the physician, and that later ones apparent to the patient be verified. Only by observing the rate of real advance can any trustworthy estimate be formed of progress to come; and the physician may disclaim the possession of any other means of judging than this which is common to himself and the patient alike.

The first thing to do on entering upon the treatment of a case of neurasthenia is, to employ the military figure of speech, to sound a retreat; and the question first in order is how far

to fall back, and where to make a stand. Sometimes the demoralization is such that there is evidently nothing to do but to retreat promptly to the ships or to the ultimate base of supplies; but very frequently it is justifiable generalship to pause and measure swords with the enemy; and a strongly defensible position may be taken and held considerably in advance of that base.

It may be decided that the patient remain constantly in bed for an undetermined but comparatively brief period; or only that a definite increase be made in the number of hours devoted exclusively to repose. The latter course offers the great advantage of leaving a portion of time daily wherein some, even if but little, exercise in the open air shall be taken. If the former plan be deemed advisable, it may or may not be necessary to introduce passive exercise,—massage or faradization, or both, as a substitute for active movement. If the circulation be feeble, the extremities cool, the skin clammy, and the muscles weak, such measures are distinctly indicated.

A capacity for taking extra sleep is highly to be prized as a means towards restoration; but some there are who cannot spontaneously attain it. If the effects of overstrain be heavily visited upon the brain, causing actual insomnia, restlessness, excitability, it is expedient to compel sleep and a dormant disposition by liberal doses of bromides, perhaps to some extent associated with chloral. In a large proportion of cases I have found an equally available and more satisfactory course than constant stay in bed, to be its daily occupancy for twelve, sixteen or eighteen hours out of the twenty-four, with darkened room and no interruptions except stated ones of the briefest duration for the taking of sustenance. The aim is to secure the largest amount possible of this time of quiet to actual sleep.

The patient may occupy the remaining fraction of the day at discretion, including one, or perhaps two, meals taken

with the family, with this stipulation, that as much active exercise out of doors shall daily be taken as the strength will permit.

Generally every form of physicial effort within doors, such as standing, ascending and descending stairs, is discountenanced, the powers being reserved for investment in those activities which should bring returns of new strength. There are few so delicate or so exhausted that they cannot bear with benefit, seated over the edge of the bath tub, a dash of cold water down the back from a sponge squeezed over the shoulders; and many can themselves secure the needful prompt reaction from the slight shock by briskly handling the bath towel. Such efforts, which may be termed the calisthenics of the bath room, should be encouraged according to the patient's powers.

As much food should be taken as can be well digested; and the determination of the amount of repose and of exercise respectively required must often be made more with reference to the working of the function of digestion than of any other function. When a large share of a profound general enfeeblement is visited upon the digestive function to such an extent that the organs of digestion are as indifferent to food as the tissues are disinclined to select and appropriate their pabulum, tonics are often for the time useless, and active exercise impracticable. Here is a case for continuous stay in bed, with passive movements and exclusively liquid diet plied vigorously and systematically. Here the logical necessity of the special plan of management identified with the name of Dr. Weir Mitchell, is inexorable up to a certain point.

The total nerve force available is so small that the stomach needs all of it; all functions but those of digestion and assimilation need to be suspended, or at least made merely accessory for a time, and the individual reduced practically to a single organ;—*venter et preterea nihil.* It is merely

carrying out to its logical conclusion a principle which needs to be recognized and extensively applied. It is that in neurasthenia, nerve power being deficient or unavailable, and insufficient to go around and give each organ and function a supply, the digestive organs are entitled to a full share reckoned by the standard of normal strength.

The function upon which the whole organism depends for the generation of force has a preferred claim, and only such overplus as there may be after this claim is fully satisfied should be distributed among the other creditors.

Little need be said of the use of medicines. Their rôle is a subordinate one; their usefulness is incidental, but not therefore trivial. A typical case of neurasthenia in a healthy subject may sometimes be successfully managed with scarcely any aid from drugs; but such cases are, perhaps, exceptional. The possible need of bromides has already been referred to. The persistence of distressing headaches will suggest the use of cafeine or some such nervous stimulant. It is at once an indication of, and an aid to, nutrition, that the bowels be free. Constipation, like headache, is often a symptom of neurasthenia, which will disappear under the policy of adjustment. If it do not, laxatives are needed. Medicines to aid the digestion and food tonics will be introduced at the discretion of the physician.

If there be uterine trouble this may sometimes be ignored or disregarded; but it should receive considerate and effective treatment in that class where the local disorder is one which does not yield to general recuperative influence alone, but which remains to vex the nerves and retard the nutrition unless relieved by interference.

In discussing this subject, an underlying idea has been that, as a rule, there should be, and generally there is, no place so suitable for the management of neurasthenia as home; and that the family physician should regard such cases as his peculiar charge, and success in their treatment as his

duty. The physician who can appreciate and make available the advantages and resources of the home, will find no difficulty in deciding at what point or stage in the treatment of a case a temporary change of scene shall be expedient and desirable; nor will he fail to recognize and set apart in the category those cases, comparatively few in number, where some of the surroundings and influences of home are essentially harmful and radically incapable of adjustment, but remain as an insurmountable bar to the patient's progress. For persons so circumstanced, and for that larger number who are dependent on their own efforts for a livelihood, and whose pecuniary resources cease when their strength fails, admission to an Institution for the care and treatment of nervous invalids is a priceless blessing.

My closing word shall be a tribute of respect and admiration for those public benefactors who endow such asylums, and for the physicians who, in the care of the inmates, give without stint, their time, experience, and skill, at the risk of exhaustion of their own reserve of nervous power.

PHLYCTENULAR DISEASE OF THE EYES.

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PHLYCTENULAR DISEASE OF THE EYES.

THE affection to which I desire to call your attention to-day is characterized by the eruption of vesicles or pustules on the conjunctiva or cornea, and often attended by much apparent photophobia. It is one with which you are doubtless all more or less familiar under some of the many names given to it. Phlyctenular, pustular, scrofulous, lymphatic ophthalmia, conjunctivitis or keratitis; herpes or eczema of conjunctiva or cornea; fascicular keratitis; ulcer of the cornea,—such are some of the designations it has received.

The extended statistics collected by Cohn show that affections of the conjunctiva and cornea make up half the sum of eye diseases. Horner found the same to be true as regards children alone, with this difference, that whereas when all ages are considered, the conjunctival affections outnumber much those of the cornea, with children the proportion is reversed; in them the cornea being implicated in 27.2%, the conjunctiva in 21.7% of all cases. Moreover, according to Horner, phlyctenular conjunctivitis and keratitis comprise more than half of the disease of these membranes in the child. Arlt also says, this is without question the most frequent of inflammations of the eye.

The very frequency of its occurrence makes its discussion appropriate before an assemblage of general practitioners. But its frequency is by no means the greatest of its claims to our interest. Its habitual obstinacy; its tendency to relapse or recur on the least provocation; the variations in

form which it manifests; the fact that its appearance is of itself alone evidence, almost invariably, if not wholly without exception, of some deterioration or imperfection of the general health; and, finally, the frequent permanent impairment and occasional destruction of sight that it causes, are sufficient reasons for its careful consideration and study. According to Birch-Hirschfeld, 6% of the inmates of the blind asylums of Saxony lost their sight from this disease. Such a percentage is undoubtedly higher than would be found in this country. The number made blind by it bears, however, but a small proportion to the number of those whose sight, in one or both eyes, is more or less seriously and irretrievably injured.

While the vast majority of those afflicted are young children, adults are not wholly exempt, though with them the disease is comparatively rare. In my experience, also, the course is usually mild in adults, even if sometimes prolonged. It is in children chiefly that severe forms are seen and disastrous effects produced.

Unfortunately, by the laity the malady is very generally looked upon as a troublesome but innocent accompaniment of teething, safe to take care of itself, and to pass away so soon as the irritation attendant on dentition has subsided, or as a sequela of measles or other exanthem, not specially requiring treatment. In consequence of this opinion the child is only too often made the subject of experiment with "household remedies," or allowed, even aided to aggravate the disorder by following its own inclinations.

For the physician, the understanding of the affection is made somewhat more difficult than need be by the prevailing habit in text books of treating of eye diseases according to their anatomical situation. There is justification for this method of division, but as a result of it, diseases of the conjunctiva and of the cornea are separated more or less widely, and where, as in the present instance, the disease is

essentially the same whether its habitat be conjunctiva or cornea, the identity does not always appear with sufficient clearness. Other reasons for confusion are to be found in the multiplicity of titles, some of them implying a relationship with other diseases which does not exist, and in the fact that by some authors certain variations of the disease have been described under different names and as if distinct affections, by others different affections have been grouped under the same name.

The term herpes applied here is a misnomer. There is no evidence that the eruption has any such special connection with the sensitive nerves as is the case with herpes generally; the lesion of the cornea which may accompany herpes zoster is quite other in character than the phlyctenulæ, and the same is, usually at least, true, when corneal or conjunctival affection is coincident with the ordinary herpes febrilis.

Eczema, on the other hand, is a frequent accompaniment of phlyctenulæ, as it is also a common affliction of young children. But a considerable proportion of the eczema observed in this connection is a secondary condition, due to irritation of the skin by overflow of tears and rubbing, or, on the lip and alæ nasi, by the catarrhal flow from the nostrils often present at the same time. The ocular changes do, indeed, resemble in some degree those found in eczema, yet there seem hardly grounds enough for adopting the title of eczema of the conjunctiva and cornea which Horner has proposed.

The main characteristic of the disease is the eruption of vesicles or pustules; these may be single or multiple, may vary in size from that of the head of a small pin to a diameter of several millimetres; the process may be exhausted with the eruption of one phletenula, or successive crops appear at irregular intervals; they may be situated on the conjunctiva, or cornea, or both, either successively or simultaneously, or may extend from one to the other. The dura-

tion of the individual efflorescence depends in the main upon its size and its situation; on the cornea the course is slower than on the vascular conjunctiva. The amount of irritation is far from being in definite relation to the severity or danger of the disease.

On the conjunctiva the eruption developes almost invariably in the near neighborhood of the cornea, and shows itself in two forms, the typical cases of which are sufficiently distinct in appearance. The more common is that of an isolated efflorescence. Beginning as a localized, elevated congestion, the centre soon becomes greyish-white or with a tinge of yellow, due to an agglomeration of lymphoid cells. The epithelial surface is thrown off, the mass of cells beneath escapes, and there is left a depression with raised edges, which gradually flattens and is again covered by epithelium, while the congestion fades. Around the pustule, both conjunctival and sub-conjunctival vessels partake in the congestion; toward the fornix, where the conjunctiva passes from globe to lid, the conjunctival congestion extends, diminishing in amount, but often increasing in breadth as it recedes from the focus of inflammation, so that the whole congested region assumes a fan shape.

Comparatively seldom, however, does the patient present himself with this typical form of congestion. Oftener, other pustules appear in various positions, simultaneously or before the first has healed, and the congested area thus becomes a wide one, with reddening of the lid conjunctiva also. If the individual pustule is small and superficial, it may run through its whole course in a very few days. From this there is every gradation to the sluggish, somewhat deep ulceration, three or four millimetres in diameter, its base ragged, greyish, infiltrated, which may be a fortnight in healing over.

The other, less frequent, type consists in the almost simultaneous development of small, often very minute

phlyctenulæ, studded along a part or the whole of the limbus conjunctivæ, close to the corneal border. The attending congestion is more general, though greatest in intensity here also at the site of the eruption. The duration of the individual phlyctenulæ is short, but successive crops follow each other more or less rapidly, and extend the time indefinitely. Both forms begin with a sensation of burning or smarting as of a foreign body, more marked in the latter variety.

So long as the affection is confined to the conjunctiva alone the subjective symptoms are comparatively light, and the prognosis is positively favorable, even if the course be somewhat prolonged. Yet, until convalescence is fully established, the danger that the cornea too may be implicated is always threatening, and when that occurs the situation becomes more serious.

The manner in which the cornea becomes involved varies. A pustule may form astride of the corneal edge, half in conjunctiva and half in cornea. Should the pustule be small it will generally heal readily and do no damage, but a large pustule in this position may give rise to a deep, funnel-shaped ulcer and to infiltration of the cornea beyond it. It is not so very uncommon for such an ulcer to extend in depth and cause perforation. The so-called fascicular keratitis commences as a pustule in this position. Here, instead of following the normal course, the infiltrated raised edge of the ulcer is pushed farther and farther into the cornea, the tissue breaking down and leaving a groove in the corneal substance behind it. At the same time, a bundle of new formed vessels extends from the conjunctiva, keeping pace in its growth with the progress of the infiltration, filling, or more than filling, the groove, while only a scarcely perceptible depression separates its corneal extremity from the grey, crescentic wall which precedes it. Usually the infiltration moves at first toward the centre of the cornea, but it general-

ly swerves a little from a straight line. It may stop at any part of its course, or cross nearly to the conjunctiva on the opposite side. It never perforates, but the vessels disappear when the process is at an end, leaving a greyish cicatrix which is exceedingly persistent and characteristic.

Different again is the behavior where there are numerous small phlyctenulæ along the edge of the cornea, in the limbus. Then, if the condition persist some time, vesicle following vesicle, the irritation excites the growth of vessels from the edge into the cornea close beneath the epithelium. The progress of the vessels depends on the degree of the inflammation at the site of the efflorescence, and they extend farther where this is greatest, but the regularity with which a fringe of straight vessels is formed along the whole circumference of the cornea is sometimes very striking. With the subsidence of the inflammation in the limbus the corneal vascularity vanishes without leaving a trace. More than a superficial ulceration of the cornea, hardly extending deeper than the epithelial layer, I have never seen with this form, but an infiltration, leading to annular ulceration of serious amount, is described as a very rare complication.

If the cornea is affected independently the pustules show the same variation in their behavior as on the conjunctiva. There is the same difference in size and number, the same irregularity in the time of their successive appearance and in their duration. They may present themselves at any part without distinction. There seems to be no place of least resistance. Congestion about the pustule is, of course, wanting, but there is circumcorneal congestion, chiefly on the side nearest the inflammatory focus, and fading toward the fornix. A small pustule may be absorbed without coming to ulceration, but this is uncommon. From the superficial, greyish, subepithelial swelling, which, losing its covering, readily heals without leaving any sign, there is every degree to the extensive, deep, yellowish infiltration, causing

deep destruction of the corneal tissue, even perforation, healing slowly, generally with the assistance of vessels growing out from the conjunctiva to its edge, and only by the formation of permanent cicatricial tissue. Through this tendency to the formation of vessels on the cornea there is sometimes, when the eruption has been repeated and long continued, a sort of pannus developed. Such a pannus mostly may be distinguished by the greater irregularity of its form and distribution from trachomatous pannus, which latter almost always starts from above, while its lower edge is approximately horizontal. Seldom, indeed, a sluggish, deep infiltration is complicated by hypopion and a low form of iritis. When it is borne in mind that, besides all the variations that have been indicated, a catarrhal conjunctivitis, with even considerable swelling of the membrane and mucous secretion, may be superadded, the possible diversity in the appearances presented is manifest.

The degree of injury to the eye as an organ of vision depends chiefly upon the situation of the lesion ; a considerable opacity near the circumference of the cornea may be of little moment in this respect, yet without directly interfering with the entrance of light to the pupil it may still do harm by changing the proper curve of the cornea. The growth of vessels toward the ulceration is always a welcome manifestation, since the reparative process is hastened by their means, and it may be said in general that the perfection of recovery, the eventual freedom from opacity and changes of curvature is the greater, the nearer the ulcer is to the circumference and the shorter the time till healing is accomplished.

Of the subjective symptoms the most prominent and most troublesome is usually photophobia, so-called. With an isolated eruption on the conjunctiva or a single pustule on the cornea this symptom may be but little pronounced. As a rule, however, it is present, and especially if the efflorescences are numerous and repeated does it often reach such a

degree as of itself to become almost a distinguishing characteristic of the disease. A child thus affected may never open its eyes even in a moderate light for days or weeks; it buries its head in its hands, in the pillow, or in the clothes of its attendant, resisting violently any attempt to turn its face toward the light. It seems sometimes as if there were an effort to drag all the features, forehead, cheeks, lips, to one common centre and heap them up over the eyes. To some extent in accord with the amount of the photophobia is the quantity of watery secretion poured out, which, by keeping the lids continually moistened, causes excoriations and increases the irritation. Yet it would be a mistake to suppose that the severity of the ocular affection is to be accurately guaged by the photophobia. Rarely, indeed, where this is pronounced is the conjunctiva alone involved; there may, however, be but few pustules on the cornea and those small and near the periphery. Precisely the worst cases, those with large, sluggish infiltration, extending deeply and causing large loss of substance (dense permanent cicatrices), or perforation with its consequences, have this symptom usually but little marked.

The title scrofulous ophthalmia, though it affirms too much, yet indicates rightly the general direction in which the cause of the disease is to be sought. Not that all individuals afflicted are scrofulous, even when the most extended application is allowed to the term; many are so, and it is in such that the most serious and persistent cases are to be found, notably the sluggish form, as well as those with great blepharospasm. But a condition of health below the norm, which carries with it an impaired power of resistance to harmful influences, is always present. Exposure to rapid changes of temperature while imperfectly protected by clothing, followed by the onset or exacerbation of catarrhal inflammation of the mucous membrane of the nasal passages and fauces, too often coincides with the beginning or increase

of the ocular symptoms to be denied an influence as a causative factor. The exanthemata—measles, scarlet fever—may be regarded as acting to depress the tone of the general system, while the congestion of the mucous membranes they cause, in which the conjunctiva shares, may well prepare the ground in some measure for the local affection.

To form a definite diagnosis we must obtain a view of the eye. In many cases this presents no special difficulty, in others the ingenuity and patience of the physician are taxed to the utmost if he wishes to avoid the use of forcible measures, and often in vain.. If the child can be coaxed to open its eyes, this is, of course, preferable; occasionally the application of cold to the lids will relieve, temporarily at least, somewhat obstinate spasm. Yet whatever means are employed they will fail in many instances, and then the only resource is the elevator of Desmarres, the child being placed on its back, and its head fixed between the knees of the operator. The use of the fingers to raise the lids in such case can never be as effective, and must produce painful and sometimes dangerous pressure on the eye.

Inspection of the eye is also necessary for the formation of our prognosis. Hesitation or mistake as to this may forfeit the confidence of the parents, a confidence often tried at the best by the persistency of the disease, and without which careful attention to the details of the treatment is scarcely to be expected. It is not to be forgotten, however, that only a provisional prognosis can be given from the condition at the moment, and the state of the general health is always to be taken into account. Although the central portion of the cornea may have escaped hitherto, no one can safely predict that it will not be affected later. Moreover, we do well to warn the parents before dismissing the case from treatment, that, for several years, with any depreciation of the general health the disease may reappear.

The treatment may be divided into general and local.

What has been said of the etiology indicates both the importance and direction of the general treatment. It should never be neglected even in the lightest cases. The diet should be easily digestible and nourishing, and attention to it in detail is always advisable; healthy action of the skin is to be promoted by frequent bathing; iron, malt, and cod liver oil to be prescribed according to the case. The advantage of fresh air and light can hardly be overestimated. Even in the coldest weather it is usually better that the patient, properly clothed, should be taken out for a time daily, and this is the more needed the poorer are the hygienic surroundings at home.

Blepharospasm, so-called photophobia, is to be feared, not for itself, but for the prejudicial consequences it entails. The violent action of the orbicularis irritates still farther the already inflamed cornea, incites to friction and consequent excoriation of the skin of the lids with the result to increase the general nervous excitability, and prevents the free bodily movement so necessary, in children especially, for the preservation of health. In considering the means for its relief, we should constantly remember that the stimulus that excites it starts from the irritated terminations of the trigeminus, not from any hyperæsthesia of the retina. The indication then is to relieve the abnormal sensibility of these terminations. It is the irritation of the corneal nerves that chiefly excites the blepharospasm, and so far as they are concerned the local narcotic effect of atropine makes this our most reliable agent. The alleviating effect of even the first application is sometimes very great. A two-grain solution may be employed every other day, or two or three times daily, and if the case is seen early the spasm may thus be kept within bounds. But should the photophobic habit, if I may be allowed the expression, be once firmly established, relief is more difficult. When the lids are persistently kept closed it is commonly useless, or worse than

useless, to intrust the application of this or any collyrium to the parents or attendants. In the efforts to force open the lids of a struggling child with the fingers, more harm is likely to be done than the atropine will counteract, and the increased flow of tears excited by the struggle will rapidly remove the small amount that has been instilled. The elevator is hardly safe in untrained hands. The application may, perhaps, be made when the child sleeps, but otherwise in such cases it is better left to the physician. Sometimes, however, reliance must be chiefly placed on less direct treatment. The benefit of cold applied to the lids has already been referred to. All friction of the lids must be prevented. Excoriations of the skin about the eyes may be washed with a solution of silver nitrate, or an ointment, containing ten grains of zinc oxide, or three or four grains each of zinc oxide and white precipitate to the drachm, be applied. The same treatment may be employed for eczema of the upper lip and alæ nasi, or elsewhere about the face, if present. Irritants are harmful. Darkness only aggravates the symptom. Within doors the light should be moderate and even, and be increased as the condition improves, but sudden changes of light, producing, as they do even in a state of health, contraction of the orbicularis, are to be carefully avoided. In the open air a dark shade, large enough to protect both eyes, though only one be affected, and arranged to stand out free from them, with a veil or smoke-glasses if required, are of use. It is by attention to details that success is to be attained.

When the eruption is limited to the conjunctiva a simple collyrium of borax in water or camphor water is often all the local treatment needed. Calomel, dusted lightly upon the conjunctiva from a camel's hair pencil, every day or two, till congestion has disappeared, seems to have a good effect in preventing relapses. But it must be employed with precaution. It should be pure and dry, only a very

thin film of it should be formed on the conjunctiva, and the lower fold should be inspected after a moment or two, that if any have collected there in a clump or thread it may be removed. The action of calomel was for a long time unknown; now it has been demonstrated that it is soluble, to a slight extent, in salt water, and it probably acts as a weak solution of bichloride. In the presence of iodine there is produced a biniodide of mercury, and it should, therefore, never be used when the patient is taking any preparation of iodine, else a troublesome eschar may be the result. Properly used it is painless, and I have myself never seen any ill effect from it.

In general, astringents are to be avoided, but when the condition is complicated with a catarrhal inflammation of the conjunctiva, mild collyria of alum, zinc, or silver nitrate are in place. Yet these should be employed cautiously, and their action watched if any fresh eruption exists.

With an eruption on the cornea, I rely, with most oculists, on the action of atropine. Its soothing influence has already been alluded to. The frequency of its application is to be governed in the main by its effect on the pupil, and it is to be continued till the ulceration is again covered by epithelium. Here, also, calomel is apparently of benefit, but is, in contra-distinction to the conjunctival affection, only to be applied after epithelial regeneration is well under way. Yet I would make one exception to this last statement. In the fascicular form of keratitis, it has seemed to me that calomel, applied somewhat freely during the progress of the band across the cornea, has sometimes checked its course. So erratic, however, is this variety, and the opportunity for studying it so comparatively infrequent, that I am willing to admit it may have been coincidence rather than effect that I observed. With the ointment of yellow oxide of mercury, much used in the same conditions as is calomel, my experience has been limited, and it has appeared to me at least less agreeable to the patient.

The sluggish, deep infiltration, whether at the edge of the cornea or more central, showing little or no tendency to the formation of vessels, demands, besides atropine, the application of hot fomentations, continued half an hour or an hour three or four times daily. These help to relieve the pain, sometimes considerable, and invite the vascular outgrowth from the conjunctiva needed to furnish material for repair. Should perforation occur, pain usually ceases as by magic, and the reparative process begins. The subsequent care after perforation does not differ from that required in similar circumstances arising from other cause.

Many and various have been the remedies recommended to promote the absorption of corneal opacities left by this or other diseases. My own belief is that none of them are of special value, and that the opacities are best entrusted to nature to reduce, as she certainly will in part. Our task, after the immediate attack has passed, is to see to it that measures to improve and preserve the general health are continuously carried out, and thus recurrence prevented.

THE USE AND ABUSE OF ERGOT.

By GEORGE L. WOODS, M.D.,
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READ JUNE 12, 1883.

THE USE AND ABUSE OF ERGOT.

THE object of this paper is to invite attention to the action and therapeutic indications of Ergot of Rye, more especially in obstetric practice, with some incidental observations upon its possible dangers on the one hand and its latent resources on the other. Although the use of oxytocics has existed from very remote times, the list of drugs which possess this property in a special degree is very short.

It has been ascribed in varying degrees to borax, cinnamon, tansy, cottonroot bark, cannabis indica, etc., but the leading member of this class which has attained such importance and universal use is undoubtedly ergot of rye; and this very fact, to the mind of the writer, justifies and calls for our constant study of this powerful agent, until we better understand its capacity and resources.

The natural history and general characteristics of spurred rye, and the numerous but unsatisfactory attempts to isolate its active principle which have been made, are familiar to us all and need not detain us. The phenomena of chronic poisoning, which Trousseau so graphically describes as seen among the peasantry of France, who largely consume ergoted rye as food, we do not see. The symptoms of acute poisoning, which also we seldom see, are, briefly, dilatation of pupils, dimness of vision, frontal headache, giddiness, stupor, collapse, and, sometimes, partial paraplegia. Dr. E. R. Squibb considers an underfed and semi-scorbutic habit of body

essential to the development of poisonous symptoms from the ingestion or administration of ergot.

The presence of ergot in rye flour may be demonstrated in the following manner. Mix a small quantity of the sample with ether, add a few crystals of oxalic acid, boil and allow the liquid to clear. A red tinge indicates the presence of ergot.

When our countryman, Dr. Stearns, first called attention, in 1807, to the scientific use of ergot as a uterine motor stimulant, its physiological action was but imperfectly understood, and, even now, eminent authorities can scarcely agree upon more than the one incontrovertible fact, that ergot increases the force and frequency of the contractions of the uterus with a tendency to make them tetanic in character. That it has a similar contractile effect upon all unstriped muscular fibre, which is so generally distributed in the hollow muscular organs, seems equally clear.

Wernich attributes the ecbolic properties of ergot to irritation of the uterine nervous centres, caused by secondary arterial anæmia of the spinal cord, due to loss of tone in, and dilatation of, the veins.

Kohler refers the contractions to increased irritability of the peripheral nerves, in conjunction with spinal anæmia.

A Committee on Therapeutics in the Chicago Society of Physicians and Surgeons recently reported that ergot excites activity of cardiac inhibitory centres, and also the vasomotor nervous centre in the medulla, thereby slowing the heart's action, causing contraction of the arterioles, increase of blood pressure, diminution of blood supply, and predisposing to death of the extremities. Very large doses, then, would seem to have a paralyzing effect upon the heart.

A knowledge of the physiological action of drugs is generally essential to their judicious administration. The most prominent action and use of a drug should not engage our attention to the exclusion of other occasional but deplor-

able effects. We should remember that quinine is not only our closest approximation to a specific in ague, but that in certain cases and conditions it works an irreparable injury to the organ of hearing, and that an ecbolic effect upon the gravid uterus has been directly caused by its careless and routine exhibition. So in the use of ergot, every consideration of professional honor, success in practice and safety of our patients, requires of us an abiding consciousness that we are using a double-edged sword, potent, not only to stimulate a flagging uterus, but equally capable in careless hands of destroying valuable life and mortally wounding a professional reputation. But, however interesting and instructive it might be to know precisely how the nervous, circulatory and muscular systems are influenced by ergot, enough may now be learned by the obstetrician to insure its safe employment.

When we reflect upon the extensive, indiscriminate and unscientific use of this potent agent by ignorant empirics long before its recognition by the profession, we may well question whether more harm than good did not result. Seventy-five years ago, when it was first introduced, medical science was embryonic as compared with its grand proportions of to-day; the investigation of new remedies was not then a daily occurrence. The drug had to wait long years before its constituents were demonstrated by analysis and it became established in popular favor. The earlier writers give meagre and careless directions for its use,* and discredit the occasional reports of its deleterious influence upon the fœtus which were made thus early. However presumptuous it may appear to criticize the medical teaching of the past fifty years, a certain independence of thought and action is justifiable. It is thus that our science progresses. In proportion as we break away from the traditional and plunge into the experimental

* Eberle, Mat. Med. 1825.

do we confirm and establish existing theories or discard and supplant them with those which are new and progressive. Because our text-books have always taught that with certain precautions ergot is innocuous in tardy labor, we are not obliged to accept the statement as a fact if it can be shown at present, or in future, that its use has not been sufficiently restricted. That such has been and even now is the case is the firm conviction of the writer.

The use of ergot in the first stage of labor is not to be mentioned in this presence.

In view of the instruction which the average graduate has received, and the fact that he enters upon the practice of obstetrics without having seen a case of labor, but with an indefinite idea that ergot is a harmless time and labor saving drug, its employment in the second stage of labor becomes a radically different matter. Abundant authority for this use, however, is attested. The indications usually given, which present such a remarkably stereotyped appearance in every succeeding work on obstetrics as to preclude in the mind of the student the possibility of any other views being entertained, may be tersely stated as follows:—In lingering labor from uterine inertia it is regarded as essential that the presentation be vertex, the cervix well dilated, the perineum and ostium vaginæ relaxed, and that there be no fœtal or pelvic deformity or other obstruction to the speedy delivery of the child. The contra-indications, as given, naturally suggest themselves, but it is the main object of this paper to express the belief of the writer, who never gives ergot at this stage of labor, but uses the forceps instead, that our authorities have been too liberal in their indications; that the contra-indications and dangers have not been fully appreciated or enumerated with sufficient fulness and clearness; that the routine administration of ergot, into which some of us fall, has been productive of great harm; and, finally, to urge its greatly restricted use.

As employed by intelligent physicians to-day, rupture of the uterus is doubtless a remote danger to the mother, but if we only had access to Clay's Handbook of Obstetric Surgery, and gave ergot when the os uteri became dilated to about the size of half a crown, as therein directed, the prospect of a lacerated cervix would be exceptionally good. The approximately uninterrupted pressure of the head upon an incompletely dilated os is well calculated to bring about this untoward result. Clay is evidently prejudiced in favor of ergot, for he allows its moderate use in primiparæ and bids for distinction in connection with its introduction to British obstetric practice.

Rupture of the perineum is an accident, irrespective of the use of ergot, which is occasionally unavoidable. The wonderful power of the uterine contractions under the influence of ergot, is best appreciated by those whose hands have been subjected to the pressure. In proportion as ergot is used does the distention of the perineum become unmanageable and the liability to its serious injury increase. Too little attention is paid to the fact that in lingering labor the maternal passages are hot and dry, and unprepared for the rapid and forcible expulsion of the child. More or fewer abrasions of the mucous lining cannot fail to occur, over which the lochia must flow and through which septic matter may be absorbed into the circulation of the mother and prejudice her chances of recovery, while lacerations of the cervix generally escape detection until long afterwards when their ultimate effects have impelled her to consult her physician.

The writer feels that he cannot too strongly urge the importance of withholding ergot during the entire period of dilatation and subsequent expulsion of the child. Exceptions will be taken to this total prohibition by men of experience who claim immunity from accident. Granting that these claims are sometimes well founded, the facts yet

remain that ergot is daily given before the cervix is fully dilated; that rigidity and laceration often follow the sudden and continuous impingement of the head upon it; that the drug is often, and repeatedly, given to save time or through deference to the wishes of the patient, and before any disproportion of diameters can be accurately ascertained. The gauntlet of impaction, the forcible passage of a large head through a small pelvis, pelvic phlegmasiæ, sloughing, septic absorption, etc., must inevitably be run.

In view of all this, and more which might be pointed out did time serve, we are confronted by this question: Do the benefits arising from this use of ergot compensate for the risks incurred? But little notice has yet been taken of idiosyncrasy. In one case the writer has seen the ordinary symptoms of collapse follow the use of a moderate dose of ergot before delivery of the placenta, accompanied by a tonic contraction at the neck of the uterus, which effectually prevented its accomplishment for several hours. Within a few years several similar cases have been reported in the journals, but whether this is an important factor in the production of the deplorable results sometimes following the exhibition of ergot, requires further demonstration.

Considering the action of ergot upon the circulatory system, an enfeebled or diseased heart would appear to be a contra-indication to its use which is universally ignored. Cazeaux emphasizes the dangers to the mother, while Schrœder argues that the persistent contraction of the uterus induced does not materially aid the dilatation of the soft parts, and disputes its efficacy as an expulsive agent. Barnes bears testimony to the unreliability of ergot, and its tendency to add to the already existing depression of the patient. Men of large observation and experience assert that ergot is treacherous if used to prevent impending hemorrhage, and that the exhausted condition of the uterus which succeeds such violent contractions sometimes predis-

poses to the emergency feared. Meigs does not give ergot for its expulsive effect, but prefers the forceps. Though abuse may grow out of the use of the forceps as well as of ergot, their employment presents marked advantages over the latter. A case which is suitable for ergot admits of their application; the liability to lacerations is materially lessened; the progress of the child is under control; the risk of asphyxia is obviated, and its safety is assured.

The danger to the child under the use of ergot can no longer be underestimated. Whether a poisonous effect is produced as has been claimed, cannot yet be definitely stated, but the tendency to tetanic contractions with prolonged pressure upon the placenta or funis seriously interferes with the oxidation and decarbonization of the fœtal blood, and imperils the life of the child. If Churchill* be followed, who allows ergot to be given when the breech presents, how can this danger fail to be materially increased when the placenta is firmly compressed between the unyielding head and the uterine wall?

Spiegelberg insists upon the necessity of carefully observing the fœtal heart after the use of ergot, in order that the forceps may be immediately resorted to in threatened asphyxia. That this is often done, may well be doubted. Benicke reports twenty-seven cases in which ergot was given during the second stage on account of uterine inertia. Spontaneous delivery occurred in but seven of these cases. It should be axiomatic with every practitioner that economy of his own time never justifies the use of ergot, but beyond every private and selfish consideration he cannot escape the responsibility imposed by a knowledge of its unreliability, its manifold dangers, and the frequent necessity for instrumental interference.

The routine practice of many physicians of giving a drachm of ergot as soon as the head is born, is also open to

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* System of Midwifery.

objection. It sometimes locks up the placenta so tightly that only time, chloroform or nitrite of amyl will release it. Personal observation leads the writer to this conclusion, although practitioners of much larger experience doubt its possibility, asserting that it has never occurred to them. This contingency, however, has long been recognized. An author, writing so long ago as 1835, says: "An overdose of ergot may produce such contractions of the uterus after delivery as to cause retention of placenta." To show that this is not an antiquated thing which has long been exploded, we may quote from so recent an author as Lusk, who takes advanced ground and represents a growing sentiment against the routine and indiscriminate use of this agent.

After prohibiting its use in the second stage of labor, except as a prophylactic against post-partum hemorrhage, he says: "The only imperative use of ergot is in post-partum hemorrhage, resulting from uterine atony; but even then it should be withheld until after the expulsion of the placenta, lest the uniform uterine contractions lead to its prolonged retention or interfere with manual efforts for its extraction."

Because of this peculiarity in the action of ergot, it cannot be relied upon in the management of abortions and miscarriages. It is after the uterus has been completely emptied of its contents, and for a varying degree of time after delivery, then, that ergot, in the opinion of the writer, meets its proper and strongest indication. No physician should attend a case of labor without having ready to hand hot water and a solution of ergotine, with appropriate syringes prepared for instant use, should hemorrhage occur after complete evacuation of the uterus. Post-partum hemorrhage is thus robbed of half its terrors.

One of the most frequent indications for the use of ergot is subinvolution of the uterus. It has long seemed to the writer that appropriate prophylactic treatment, provided it could be

applied, would greatly reduce the number of these cases. This treatment, which is found to be impracticable without the hearty co-operation of the patient, should begin from the moment the third stage of labor is completed. At this time, when the uterus has thrown off the burden which it has carried for nine months, the organ weighs, according to Heschl, from twenty-two to twenty-four ounces; and its length, according to Bœmer, who has measured in sixty-four cases, averages a little more than six inches. Hewitt gives the length as eight inches. At the end of the first week, at which time women often get up, the uterus weighs from nineteen to twenty-one ounces; at the end of the second week, from ten to eleven ounces; at the end of the third week, from five to seven ounces, and the nearest possible approach to the normal weight of about two ounces is not reached until the close of the second month. The new mucous lining of the organ does not form before the third week. We must dissent then from the views of an eminent writer, if, as reported, he advocates the encouragement of the patient to rise and dress on the third or fourth day after delivery in ordinary cases. The writer ventures the opinion that this time for keeping the bed or lounge is much too short. Indeed, the time-honored period of nine days does not seem long enough. At this time, even, although the bulk of the uterus is considerably reduced, we have seen that it yet remains enlarged, soft, congested and too heavy for its relaxed supports. Walking, standing, lifting, pelvic inflammations, etc., contribute to retard the process of involution, in many cases entirely arresting it short of completion, when we have resulting the condition of subinvolution, the grand predisposing cause of that long train of symptoms so familiar to the physician. Have we not here a clear indication for prophylaxis?

The patient should not only be kept longer in bed to facilitate involution, but we shall do well to remember that

it is the soft, spongy, subinvoluted uterus for which Bartholow recommends ergot. Believing that the process of involution is materially aided and advanced by the cautious use of ergot, it is the practice of the writer to give it in moderate doses for some days after delivery. Corroborative evidence of the value of this plan of treatment is not yet abundant, but Dr. Garrigues, of New York, may be quoted upon the use of ergot as follows: "Ergot ought never to be given during labor. I use this drug in every labor, but not until after the placenta has been expelled. I give it even for four or five days, because I think that by causing contraction of the muscular coat of the blood-vessels it counteracts absorption of septic matter, and by increasing uterine contraction insures good involution." The abuse of the use of ergot is by no means confined to the profession.

The late William Warren Greene once urged upon a class of students the propriety of using the simplest language with their patients, but recommended the invariable employment of scientific language among themselves. Some exceptions might reasonably be taken to the first injunction. We should all realize the wide spread tendency to escape the dangers and responsibilities of maternity. Women are in constant temptation to seek means and use them privately to accomplish their object. Frequently we find them in the cities using ergot with the avowed intention of procuring an abortion. To all inquiries, from whatever source, concerning the nature and effects of ergot, guarded answers should be given,—not necessarily false, but calculated to divert the mind from its ecbolic properties, and the botanical name only should invariably be given, as less likely to be remembered than the common one.

The unreliability of ergot has caused great annoyance. Camphor prevents much deterioration of the powder, but a fresh preparation is more reliable. The addition of one per cent. of acetic acid renders the liquid preparation permanent.

As it is sometimes desirable to give ergotine for several weeks in succession, it becomes not only an interesting but important question as to how long the remedy can be given with safety. Doubtless no fixed rule can be laid down; but as some evidence can be advanced to show that ergotine has a cumulative effect upon the system, prudence would seem to dictate conservatism.

At a meeting of a medical society in Paris, some time since, Dr. Boissarie called attention to the possible dangers attending the prolonged administration of ergotine by the mouth. He detailed the case of a young woman of twenty-five, with albuminuria, who took a daily dose of two centigrams of ergotine for four weeks. About a month after cessation of treatment, gangrene developed in both inferior extremities.

Dujardin-Beaumetz relates a case of enteric fever, in which gangrene supervened after the exhibition of a daily dose of one gramme of ergot for one month. A case of pulmonary gangrene in a child of thirteen years has also been reported. Ergotine, in a daily dose of two centigrams, was given by the mouth for about two months for incontinence of urine. Fatal hemorrhage occurred within a month after cessation of treatment.

Dr. Lusk, of New York, reports a case of fibro-myoma of the uterus treated by ergotine injections into the subcutaneous tissue of the abdomen over the tumor. The bulk of the growth was rapidly reduced, but at the expense of gangrene of the compressed tumor and fatal septicæmia.

[illegible]

[illegible] question as to how long the remedy can be given [illegible] can be laid down [illegible] upon the [illegible] would [illegible] remain.

[illegible] meeting of a medical society in Paris, [illegible] called attention to the [illegible] administration of [illegible] for the [illegible]. He [illegible] a young woman [illegible] a [illegible] dose of ten [illegible]. Along a [illegible] developed [illegible]

[illegible] a case of [illegible] after the [illegible] of [illegible] for one month. [illegible] a [illegible] of [illegible] dose of five [illegible] within a month [illegible]

[illegible] New York, reports a case [illegible] injections and [illegible]. The [illegible] but at the expense of [illegible]

THE EARLY SYMPTOMS OF GENERAL PARALYSIS OF THE INSANE.

By WILLIAM B. GOLDSMITH, M.D.,
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READ JUNE 13, 1883.

THE EARLY SYMPTOMS OF GENERAL PARALYSIS OF THE INSANE.

As physician in hospitals for the insane, I have received many cases of general paralysis in which there had been an entire failure to appreciate correctly the at least possible import of various symptoms appearing before the unmistakable ones, which failure was sometimes attended with serious injury to the patients or others; for in disorders affecting the organ which controls the individual in his moral obligations, professional duties, social relations, and business transactions, the early recognition even of disease which we are forced to regard as incurable, has more practical importance than exists in disease of other organs, where an early accuracy of diagnosis often simply hastens the "verdict of despair" to the patient, without benefiting his fellows; and among the various forms of mental disorder, there is probably none which, in proportion to its frequency, so often before its recognition ruins the laboriously acquired and carefully guarded reputation of a lifetime, or involves relatives in scandal and financial reverses.

This failure of appreciation of early symptoms is probably partly because general paralysis, unlike most other forms of disease attended with mental decay, does not usually select its victims from those who have inherited weak and unstable nervous organization, but from the capable and vigorous, in whom no one expects weakness to show itself, and partly because certain mental symptoms are so striking, that we

are liable to identify them with the disease, and not recognize it without them.

My remarks are based on an analysis of the histories of one hundred cases, and I think that they possess more accuracy as to fact than the average of such histories, because I have taken the cases of such patients only as had been under the careful observation of friends whom I believe to be intelligent and reliable.

This plan is open to the objection that the facts are largely obtained from non-medical and non-expert observers; but this is a source of error that cannot be avoided in studying mental disease, because the earlier symptoms have usually persisted some time before the case comes to the general practitioner, and still longer before it reaches the specialist, and, as subjective examinations as to previous history cannot be considered reliable, the observation of friends is our only resource; and it may be said in favor of the accuracy of my facts, that friends are much more likely to recall slight changes in a retrospect, and to frankly tell the whole truth concerning mental symptoms when they have become sufficiently marked to render it desirable to send the patient to a hospital, than earlier, when they feel anxious to cover up improprieties and weaknesses. It is also true of these cases, that they were selected at a time when the diagnosis was unmistakable, so that, whatever may be said as to the occurrence of similar nervous symptoms in patients who do not become general paretics, it is undoubtedly true that they were in these patients the warnings of that disease, and my aim is, not so much to record the symptoms after they have become sufficiently characteristic for a certain diagnosis, as to show what are actual danger signals that should render the physician alert and observing; the recognition and observance of which would, I am sure, prevent much financial loss as well as danger to individuals, and unjust condemnation by legal tribunals and

society; and it is reasonable to suppose that the nearer the beginning we start, the more likely we are to prevent the dire ending which we now regard as inevitable. That these signals will be most varied and inconstant follows from the nature of the disease they indicate, as we must remember that there is no variety of nerve-tissue in the cerebro-spinal or sympathetic system which has not been proved to suffer degenerative lesion consequent on this disease, or which has not been claimed, with fair assurance of accuracy, to have been the seat of the initial active lesion of its commencement. Lewis has traced the descending degeneration as far as the sciatic nerve, and Westphal and others have described ascending degeneration from lesions of the spinal cord, traumatic and others, while some recent observers think that some cases at least have the origin ascribed to the disease by Messrs. Poincaré and Bonnet, who, in 1863, found marked changes in the sympathetic ganglia and considered them primary.

As this paper is not designed for those who have given special attention to nervous diseases, I will venture to recall the variety of symptoms likely to be present, and I will enumerate them as nearly as possible in what I believe to be their order of frequency. It is a disease always presenting during its course both motor and mental symptoms, which, however, may vary greatly in their character, intensity, and order of appearance. The motor symptoms are always evidences of diminished muscular power or control, and may affect any muscles, but usually do appear first in those groups whose functions require the greatest harmony and nicest adjustment in action. Hence the common early motor symptoms are defective articulation, tremor of the tongue, tremor of the facial muscles when expressing emotion, irregular chirography, inability to control the hands in such nice movements as are requisite in playing musical instruments, gen-

eral tremor, inco-ordination or paretic weakness of gait, and occasionally localized chronic spasms, most frequent in the face. Perhaps, too, the seizures which occur sometimes during the history of most cases may best be included with the motor symptoms. These may occur at any time, and may simulate petit mal, grand mal, apoplexy, or have a mixed character peculiarly their own.

Of sensory symptoms there may be dysæsthesia, hyperæsthesia, anæsthesia; and, exceptionally, almost any variety of neuralgia.

My experience leads me to regard disorder of the special senses as a rare early symptom and not very frequent later one, but both impaired function and hallucinations of all are reported.

To the sympathetic system probably may properly be charged most of the pupillary changes, which are: inequality, usually shown most strikingly by the failure of one pupil to dilate as readily as the other in moderate light; a marked decrease in the size of both, making sometimes the pin-hole pupil, and sluggishness in action in varying light, in accommodation, and in answer to sensory stimuli. To the vaso-motor control of the sympathetic must also, I think, be ascribed the irregularities in the superficial circulation, frequently shown by localized or general flushings, resembling that seen in one accustomed to alcoholics when slightly under their influence. There are other symptoms which cannot well be classified pathologically, but which possess some value for diagnostic purposes; as the condition of the tendon reflex, which may be not noticeably changed, increased, or absent.

Similar changes of increase or diminution may occur in the skin, cremasteric and sphincter reflexes, but are not often seen until later in the disease.

All known mental symptoms are found with greater or less frequency, those usually considered characteristic being

a marked feeling of self-complacency and content, and delusions of wealth, greatness and power.

Eighty-seven of my one hundred cases were men, and thirteen women, but I have not considered them separately except as regards some mental symptoms which seem modified by sex.

The frequency with which each of the various physical symptoms mentioned appeared as the first physical change is as follows:

Some defect of articulation thirty-eight times. The text-books often attempt to enumerate various kinds of articulatory defect that occur in general paralysis, but any such classification is rather incomplete and misleading, as any part of the articulatory apparatus may be chiefly affected and all kinds of disorder occasioned thereby. A hesitancy of speech, recognized best when the patient is quietly conversing, and an occasional elision of a syllable, best recognized when the patient is earnestly conversing, are probably most frequent.

Some form of seizure appeared first twenty times. Thirteen of these seizures resembled closely the convulsions of grand mal, the patient falling to the ground and being generally convulsed, but none of them are known to have given the epileptic cry, and the succeeding coma or stupor was much more pronounced and prolonged than in ordinary epilepsy. Four of this thirteen were sent to the hospital diagnosticated simply as cases of epilepsy.

Four of the seizures resembled petit mal, the patients losing consciousness, but having no noticeable convulsion. Three were considered apoplectic attacks and resembled apoplexy in that the patient fell, and remained completely or partially comatose for a time, with little or no convulsive movement. My cases indicate that seizures should have greater prominence as early symptoms than is given them by most authors, but I am unable to say whether they are exceptional in this respect or not.

Tremor of the lips and face was noticed first eight times.

Inco-ordination of gait, ten times.

Diminished sexual power, six times.

General tremor, six times.

Cutaneous numbness and tingling, three times.

Changed chirography, two times.

Dilatation of superficial capillaries and sensations of heat, once.

Dilatation of superficial capillaries and marked hyperidrosis, once. (I have seen this same marked hyperidrosis in one other case as a later symptom.)

Localized cutaneous hyperæsthesia, once.

General cutaneous hyperæsthesia, once.

Ptosis, external strabismus, and diplopia, once in a syphilitic case.

Diplopia alone, once in a syphilitic case.

Failure of sight from atrophy of the optic nerve, once in a syphilitic case.

Nine of these patients also suffered from decided pain and discomfort in the head previous to other symptoms—it being sufficiently marked in four cases to excite suspicion of brain disease.

There are some other symptoms which may have appeared early and escaped notice, as they are of a character not likely to attract the attention of the non-medical observer, and I can only give their relative frequency at the time the patients were admitted to the hospital, which was at varying stages of the disease. Thus the patellar-tendon reflex appeared normal in forty-six cases; markedly supra-normal in twenty-four cases; very marked but not necessarily supra-normal in fourteen; very slight but not necessarily below normal in twelve; absent in four.

The number of cases in which it was found supra-normal is comparatively greater, and the number in which it was found slight or absent less, than in those observed by Mickle

in England and Westphal in Germany, but corresponds pretty closely with Shaw's observation in this country.

My whole experience, which extends over a larger number of cases than the one hundred mentioned, agrees with the ratios of their figures as to patellar-tendon reflex, and my estimate of its usefulness in diagnosis is as follows: The absence of change does not render the disease improbable.

Well-marked exaggeration in both legs is strong *corroborative* evidence of general paralysis. Diminution or absence of it is decidedly less so, but still has some value.

There has always been disordered gait in the cases where I have seen it absent; and, I have no doubt, tabic lesion of the cord.

I carefully observed the length of duration of the disease at the time when the examination of the knee jerk was made, but there was no indication of a connection of particular conditions with different stages.

On admission the size of the pupils was unequal in sixteen of my cases, the right being larger in ten, and the left in six. Both pupils were abnormally small in six cases, and both dilated in four. None of these changes seemed more frequent at one stage of the disease than at another.

These figures indicate that inequality of the pupils is not very common, and my own opinion, based on the examination of other cases, in addition to these, is that its diagnostic importance is usually overrated by the text-books, as its absence has no significance and its presence may be the result of several causes other than general paralysis.

The mental change which appeared first most frequently was failure of capacity. This was true of thirty-six cases, it being chiefly noticeable in nineteen, because of impaired power of memory, and I will venture to remind you that, as this failure is most frequently due to lessened power of attention, the examination should not be concerning events occurring long ago when there was presumably mental

integrity, but concerning trivial matters of recent occurrence. Dr. Holmes makes his old man testily refute this imputation of failing memory by saying: "I remember my great-grandma! She 's been dead these sixty years."

And many a general paralytic can give you an accurate history of the events of his previous life long past, when he is unable to tell you where he dined day before yesterday. It is also true that the memory will occasionally assist the patient to conceal failure of reasoning power, as in the case mentioned by Mendel, where the patient answered readily and correctly, that twelve times twelve is 144, but made twelve times thirteen a less number.

In eleven cases the mental failure was evinced by poor judgment in business, without manifest change in activity or habits of life, and in six cases this entailed serious financial reverses on the patient and his family.

In the remaining six cases of mental failure it appeared simply in mental sluggishness, great and unaccustomed disinclination for mental or physical exertion, accompanied in three cases by a striking tendency to sleep.

Marked depression without obvious delusion was noticed first twenty-two times. Marked exhilaration and self-satisfaction, seventeen times. This was accompanied by erotism in nine cases, two of them attempting rape, two indecent familiarities and exposure, and three began an unusual and scandalous course of licentiousness. Several others of this class, before abstemious, became addicted to alcoholic excesses, and attention was attracted to two by thefts which were undoubtedly the outcome of the disease, though not so recognized until the courts had taken action in both cases and one of the men was in prison.

Insane delusions were noticed first twenty-five times. They were the characteristic ones of wealth and greatness, in twelve cases.

Six showed a variety of delusions of persecution; six be-

lieved their wives unfaithful, probably chiefly because their erotic desires met repulse, and were dangerous to them thereby; and one had general delusions, based on hallucinations of hearing.

Maniacal excitement, of extreme intensity, sometimes appeared very rarely in fifteen cases, but was not the first symptom noticed.

The thirteen women exhibited no marked variation from the men in physical symptoms, but the mental symptoms were commonly much less pronounced and active.

Six showed simple dementia. Three had definite delusions that men outraged them; and two, delusion that some spirit or angel had sexual intercourse with them.

Two had ordinary delusions of persecution. Several of those who had delusions of being outraged thought themselves pregnant; and this is, by some observers, considered a frequent delusion among female general paralytics. I think that the delusions as to sexual intercourse usually depend on the misinterpretation of an orgasm, experienced at night; and those of pregnancy, indirectly on the same, or on anomalous sensations in the abdomen.

Three of these women were of very good social position, and this is a larger proportion than is found abroad, where general paralysis is considered very rare among those having the social rank of ladies.

The relative time of appearance of the two classes of symptoms was as follows: In sixty-eight cases the mental and motor symptoms were noticed at the same time.

In twenty-four, mental symptoms alone first attracted attention; and in eight, the motor symptoms.

These figures are undoubtedly inaccurate, as slight changes, particularly of a motor character, might readily escape the notice of a non-expert observer, and some motor changes would unquestionably have been observed by an expert in many of the twenty-four cases which are recorded

as presenting mental symptoms alone at first, but they do show that much difference of time between the appearance of the two classes of symptoms is exceptional, though it is true that either may show remissions or intermissions early in the disease, so that their existence can only be learned by careful questioning as to the previous history. Thus, one may see a patient laboring under intense maniacal excitement, in whom no motor paresis can be detected, but who has a history of previous convulsive seizures, or attacks of unconsciousness, which change the diagnosis from curable mania to general paralysis. In one of my cases, a woman, marked defect of articulation was for some time regularly present each morning, but disappeared before noon, and it is not at all uncommon to see pronounced symptoms of any kind diminish greatly or disappear, if the patient is changed from excitement and dissipation to a quiet routine of life.

In the few cases where mental symptoms appeared to me to unquestionably precede the physical, they were almost invariably those of marked depression not reaching the grade of positive insanity, and the physical symptom that appeared alone first most frequently was some form of seizure.

Finally, the symptoms presented by these cases appear to me to indicate, with the somewhat moderate weight of authority to which their numbers entitle them:

1st. That the striking and characteristic group of symptoms ascribed to the disease by Calmeil in 1826, and having greatest prominence in most text-books since, is to be found only exceptionally in the cases of to-day at the time when the diagnosis is the most important.

2d. That physical and mental symptoms usually appear nearly synchronously, so that the physician has the presence or history of both to aid him when called upon for a diagnosis, and it is probable that most of those who report cases of general paralysis without mental impairment are

not sufficiently expert to recognize a moderate degree of dementia.

3d. That their observations agree with those of most writers in making defective articulation the most frequent and characteristic early motor symptom.

4th. That changes in the pupils and disorders of gait are less frequent and have less value in diagnosis than is usually ascribed to them, and that given pupillary changes are no more frequent in one stage of the disease than in another.

5th. That the patellar-tendon reflex is found markedly supra-normal in nearly twenty-five per cent. of general paralytics, and that the presence of this symptom is of strong corroborative value in diagnosis, though its absence has none, and that no peculiar condition of the patellar-tendon reflex can be associated with any given stage of the disease.

6th. That hallucination or impaired function of the special senses is very rare as an early symptom; hallucination (auditory) having been noticed first in but one case, and impaired vision but once in a syphilitic case. The diminution in the sense of smell, which Voisin thinks very frequent in the early stages, was not noticed in any of my cases, though it may have been present and escaped attention in some, as slight failure is difficult to recognize.

7th. That it is of great importance in the case of a patient showing mental symptoms to inquire carefully for a history of convulsions or loss of consciousness, as these were the first motor symptom in twenty of my cases.

8th. That among mental symptoms the marked exhilaration, with delusions of wealth and greatness, which is usually considered the characteristic mental symptom, is present early in less than one fourth of the cases, and that simple failure of mental capacity and activity, and mental depression, are the more frequent first mental changes.

MINOR INJURIES OF THE SPINAL CORD.

By BENJAMIN H. HARTWELL, M.D.,
OF AYER.

READ JUNE 12, 1883.

MINOR INJURIES OF THE SPINAL CORD.

The subject presented for consideration to-day comprises a class of diseases arising from slight injury to the spinal cord, and is based upon the notes of nine cases, in which both the injury and the force used to produce it were slight. Five of the nine were passive or subacute hyperæmia, and four a mild form of chronic myelitis. These cases were of from two to twenty years' duration, and were not severe enough to prevent a certain amount of labor being performed.

Erichsen, in his work on "Concussion of the Spine and Nervous Shock," says: "The primary effects and secondary results of slight injuries to the nervous system do not appear, as yet, to have received that amount of study and attention on the part of surgeons that their frequency and importance alike demand." These minor injuries are of special interest to us, as practical physicians, from their comparative frequency, their liability to result in permanent change in the substance of the cord, and because we can do much in the way of relief and cure by appropriate treatment.

Their importance in a medico-legal point of view is at once recognized; for while there could be no doubt of its gravity if the injury were severe, in the form under consideration there is not only no external sign, but a limited time may elapse without symptoms, of injury. The question presents

itself here, as to whether we have in every case of injury to the cord sufficient evidence—objective symptoms—to enable us to determine the fact. Dr. R. M. Hodges* says: "The symptoms of actual organic changes in the spinal cord, when they follow concussion, are by no means vague and obscure manifestations. They are objective, and admit of recognition and appreciation. They are incapable of being simulated with an accuracy which will permit of long deception. The subjective symptoms following alleged concussion of the spinal cord are ill defined, vary in degree and character, and such as permit of ready simulation. If objective and subjective symptoms are both present in any one case, as not infrequently happens, the objective symptoms predominate." Hamilton† says: "I do not think that any jury should give damages unless some physical signs of actual spinal disease are present." While I would not like to take the position absolutely that the objective symptoms are well marked in every case of so-called concussion, it must be rare indeed for a doubt to remain in the mind of one who has watched a case from the beginning. Those vascular disturbances which act as a cause of the symptoms in these cases, and which may be followed by inflammation, or changes in the substance of the cord, must soon produce a train of symptoms by which the lesion can be recognized.

CASE I.—J. B., aged 44, a strong, able-bodied man, was shaken in a railroad accident, but not thrown from his seat. He was seen within a few minutes, and complained of pain in the lumbar spine and numbness in the extremities, chiefly on the right side. There were no external evidences of injury. The temperature, pulse and respiration were normal. The catheter was used twice in the first twenty-four hours, but not afterwards, though he seemed to have a good

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* Boston Med. and Surg. Jour., April 28, 1881, p. 389.

† Nervous Diseases, 2d edition, p. 271.

deal of difficulty in starting the urine. The bowels were constipated. No special change took place until the tenth day, when there was a dusky, mottled appearance of the skin over the upper portion of the body, rapid breathing, cardiac murmur, intolerance of light, and muscular twitching. He stated that the left hand felt as if encased, that there was a band feeling around the left half of the body under the nipple, that he was unable to see plainly, and had a severe pain in the back of his head. He could move the left arm and leg better than the right, and there was some anæsthesia, more marked on the right side. This condition, changing to better then worse again, remained for several weeks, when improvement commenced with the probability of perfect recovery.

In this case the objective symptoms were sufficiently prominent for us to pronounce it an injury of the right half of the cord.

In another case, where a locomotive demolished a carriage containing a young lady, and threw her some distance along the side of the track, she remained standing while being subjected to a thorough examination in view of possible litigation. There was no complaint of pain in the back, and not till the fourth day did symptoms denoting spinal injury show themselves, when she grew rapidly worse, was confined to the bed, but after five years has made a partial recovery.

That form of spinal injury produced by concussion, or the jar of the railway carriage, is an interesting one, in view of the increasing number of men who by occupation are compelled to maintain an erect position for from six to twelve hours a day, subjected to the constant jar of the carriage. Hamilton* mentions cases of subacute spinal hyperæmia occurring among city car drivers; and Hodges,† in

* Loc. cit., p. 256–7.

† Boston Med. and Surg. Jour., April 21, 1881, p. 365.

the paper referred to, speaks of the jar to which railroad men are exposed, as being sufficient to produce nervous disease. The trifling jar seems necessary to produce hyperæmia, position alone not being enough. In Cases II. and III. a rough ride aggravated all the symptoms, while any position in which the jar was removed gave comparative relief. Spinal hyperæmia is favored by the peculiarity of the circulation of the blood in the spinal canal; and we can readily understand how blood stasis, to a certain extent a natural result of these anatomical conditions, can become abnormal. Jaccoud says that the tortuous course of the veins and the absence of valves favors it. Bartholow* puts the arterial and venous capacity as one to four; that is, the capacity of the veins is four times that of the arteries.

CASE II.—Mr. S——, locomotive engineer, sixteen years on the road. General health good. After six years of service, there was a sense of weakness and easy fatigue in the feet and legs, and pain in the back and head after hard drives. These symptoms gradually grew worse, and seven years after, his condition was as follows:—Temperature, pulse and respiration normal. There was pain more or less constant, described as a "hard ache," extending from the sacral region up the spine, and through the head to the supra-orbital region. There were numbness, prickling and formication in the extremities; the first two most noticeable below the knees, the latter on the back of the neck. The feet and hands were cold, the legs felt as if made of wood; at times, when the pain was excessive, he would stagger in walking, and in the dark had a constant fear of running into a post or other obstacle, so that it was his custom to walk in the middle of the street. If he stepped too heavily, or struck his hand firmly against an object, he would feel the blow in his head. He told me that he had stood on his toes during many miles of travel to avoid the jar. There

* Medical News, Dec. 16, 1882, p. 673.

was frequent urination. The rectum was not involved. He saw flashes of light, and sometimes felt as if a shade were placed directly over the eyes. There was lack of co-ordination; at times he could see best with one eye closed, it made no difference which one. There was some tenderness on deep pressure over the last cervical and first dorsal vertebræ. The cincture feeling was not present. Tendon reflex was natural. Ergot and belladonna were given in full doses; the latter afforded the most relief. After two months of rest, he resumed his place on the engine, though not fully relieved; at the end of a year, restoration to health seemed to be complete, and remains so after three years.

CASE III.—Mr. M——, conductor, has been on the road seventeen years. His physical condition is good. About seven years ago he commenced having pains in the lumbar region, and irregular pains down the left leg, with prickling and formication. When I saw him the trouble had increased, and involved both legs, the prickling and formication being most noticeable on the plantar surface of the feet, and across the upper surface of the toes. There was occasional stiffness of the ankles, from muscular rigidity, and a feeling described as that of walking on a thick Brussels carpet, which would sink under the feet. There was a good deal of pain in the lumbar spine, and irregular pains radiating down both legs to the feet. These symptoms were always worse after a hard day's work, a long walk, a ride on the horse cars, and in hot weather. They were not present as a rule during the first part of a day after a night of rest. Latterly there have been some muscular cramps in the left leg, and the trouble seems to be extending. There is slight tenderness over the first lumbar vertebra. The pain in the leg is relieved in a measure by strong flexion without regard to the position of the body. This case has but recently come under treatment.

The above were two cases of passive or subacute hyper-

æmia; the first involving the cervical, and the last the lumbar enlargement of the cord. They were caused by the continued jar of the railway car, irrespective of any injury that might, by its effects upon any portion of the spinal medulla, predispose it to lesions of this kind. To what extent these diseases prevail among railroad employés I am not able to state, but a somewhat extended inquiry leads to the belief that they are more rare than has been claimed by some authorities.

Backache is said to be a common complaint among the class of men referred to, but I am ignorant of its cause—whether it is muscular, in the sacral plexus of nerves, or depends upon an increased amount of blood in the spinal canal. In view of the cases just mentioned, which for the first few years were only indicated by an occasional backache, pain in the back among railroad men demands the closest investigation.

Most of the cases of which I have notes, were caused by slight concussion, blows or other means, which produced no external signs of injury. The patients were able to attend in part to their daily duties. With some, the trouble excited but little attention for months, although they were conscious of its effects, and gave a clear history back to the time when the injury was received. Rosenthal says, "In order to recognize the initial symptoms of myelitis, we must pay strict attention to the first peripheral symptoms of medullary irritation. These are vague neuralgic pains, which are often unrecognized, or wrongly interpreted, circumscribed sensation of cold or numbness in the limbs, circumscribed anæsthesia, etc."

The following cases will serve to illustrate:—

Case IV.—Mr. P——, twenty-three years ago, was injured in the United States service. While carrying one end of a long box the opposite end was dropped, and he felt the shock in the lower part of the spine. He served out his term of

enlistment, and has since worked at his trade, that of cabinet maker. From the time of the accident he has had more or less pain in the back, prickling and numbness in both legs, chiefly in the soles of the feet, and a cord-like feeling from the superior spinous processes of the ilia around the back. For the past three years he has felt as if a cushion were interposed between the bottom of the feet and the ground, the legs have felt heavy, and the toes have scraped the ground more or less in walking. He is apt to trip upon a stone or uneven surface. There is a good deal of muscular atrophy. The general health is good, though he has lost about thirty pounds in weight during the last few years. The bladder and rectum are not involved. Tendon reflex is absent in the left leg, and very slight in the right. There is some tenderness on deep pressure over the first lumbar vertebra. The most pain is experienced, and all of the symptoms are aggravated, after the completion of the work of the day. The best sleep is obtained during the first hour or two of the night, after which the position is frequently shifted, and the sleep disturbed by pain. Strongly flexing the legs and thighs gives some relief to the pain. He is worse during hot weather.

Case V.—A young, able-bodied farmer received an injury in the lower dorsal region, by the sudden turning of a plow, caused by its striking a stone. He did not consult his physician for a year after the accident, although he felt pain from the first. At the end of two years his condition was much like that of Case IV., except that it was milder in degree. At no time had he given up the management of his farm, though compelled to obtain help for the harder portion of the work. In the course of a year cure seemed to be complete. He remains entirely well at present, three years after recovery, having in the mean time performed the hardest kind of farm work. Treatment consisted of moderate exercise, dry cups on each side of the spine oppo-

site the lumbar enlargement, night and morning; galvanism; one-half, increased to one, teaspoonful of the fluid extract of ergot, three times a day, occasionally combined with belladonna. The same treatment has been applied to Case IV., always with an amelioration of symptoms for a while, but circumstances over which I have no control prevent its being carried out satisfactorily; and, though still under treatment, the probability is that there will be a gradual increase of the disease.

The symptoms in these cases point, with hardly a doubt, to transverse lesions of the lumbar enlargement of the spinal cord. Case IV. is probably one of chronic myelitis, with impairment of the functions of the gray matter, and that the trophic function is becoming affected is shown by the muscular atrophy. Case V. is one of passive hyperæmia. Erb* says that "Hyperæmias do not always extend over the entire spinal canal, but often are confined to the cervical, or lumbar, or other portions;" and again, "in a few cases something is seen which lies between the condition of congestion and that of inflammation." The line between hyperæmia and myelitis is probably an artificial one; they may be regarded as different stages of the same disease. Profoundness of the disturbances of sensation and motion is perhaps the best point to judge by at first, if we are to make a distinction between them, and later the result of appropriate treatment; cure only resulting when hyperæmia alone exists. Therapeutically it makes no difference, as the treatment would be the same whether we have before us a case of passive hyperæmia, or a mild form of chronic myelitis.

The early symptoms of some of these cases are like those of sciatica. Case III. was markedly so, the only complaint for the first three or four years being pain in the back and left leg. The location of the spinal lesion explains

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* Ziemssen, vol. xiii. p. 203.

this, for Ranney,* in a diagram giving the relation of the spinal cord, nerves and vertebræ, shows that the sciatic nerve rises from the lower portion of the lumbar enlargement of the cord, opposite the twelfth dorsal and first lumbar vertebræ. Tender points along the course of the nerve will help to distinguish a simple neuralgic affection; moreover, in congestion and inflammation, before many of the characteristic signs appear, there will be an aggravation of the symptoms after continued exercise, prolonged recumbent position, and during the latter part of the night and first part of the day; again, these cases are usually worse in hot weather. A history of injury to the back is so common, that to be of value in diagnosis it must correspond to the appearance of first symptoms.

Reflected troubles, and those of an hysterical character, must be carefully excluded. In a case (not included in the nine) with a history of injury, and many of the symptoms of spinal hyperæmia, complete relief was obtained by the removal of some vascular growths from the uterus with the curette. Trial of remedies will sometimes assist in diagnosis. In progressive cases, that is in all acute cases, and in cases chronic as regards time, but in which there is locally an active state of the circulation, strychnia does harm, while ergot and belladonna will usually give relief to the distressing symptoms. In functional cases, on the contrary, and in those old chronic ones characterized by debility and loss of muscular power, strychnia almost always does good, and is sometimes very effective.

Some of the cases of minor injury of the spinal cord fully recover, others remain greatly relieved, and a few relapse into almost helpless cases of chronic myelitis. In the latter the change is frequently sudden. Those that get well are probably only hyperæmia. Of the nine cases

* Applied Anatomy of the Nervous System, p. 340.

which form the basis of this paper (the cases of concussion from railroad accident are not included), three remain cured after the lapse of several years, three are still under treatment, with a prospect of cure in one, one is gradually growing worse, one remains better than before treatment, and one, after seemingly being relieved of passive hyperæmia for two years, had a sudden lighting up of the disease, without apparent cause, and is a helpless invalid. The cincture feeling was present in all of the above cases, except the two caused by jar of the railway carriage; and again, excepting these two, all were aggravated by the recumbent position maintained for more than a few hours at any one time. One voluntarily assumed the knee-chest position in bed to obtain relief from pain. As a rule, reflex excitability and electric contractility were not markedly changed; if at all, they were increased; though in Case IV. they were almost entirely absent, more so in the left than right leg. In a case of syphilitic myelitis, now under treatment, simply touching the bottom of either foot brings about spasmodic movement in both legs.

This paper would not be complete without giving an outline of the treatment which has been found beneficial in the above class of diseases of the spinal cord. Rest is of the first importance, not absolute in the recumbent position always, but in the sense of relief from care and ordinary duties. As previously mentioned, the patients in all of the nine cases noted were, at the time application was made for relief, engaged more or less actively in labor; and, although in two or three of them treatment was carried on without change in this respect, still it was much more satisfactory when partial or complete suspension of work was obtained.

Ergot and belladonna, as recommended by Brown-Séquard, have been found to be remedies of undoubted efficacy. Belladonna is more prompt in its action, especially when there is some vesical complication. Ergot is of most value

when given in large doses, and long continued. The latter, usually in a few days, affords some relief to the intense pain in the back; the former, given so as to produce its full medicinal effects, in many cases stops all pain for the time, and if continued has a permanently good effect. In acute cases, ergot seems to do harm, and digitalis, aconite and bromide of potassium should be given instead. In Case I. ergot aggravated the symptoms on two trials, while the good effect of digitalis was seen, to a certain extent, within a few hours after administration. Bartholow* says, "Its [ergot] administration in spinal inflammation is improper, because of the peculiarity of its action. It induces an anæmia of the arterial distribution—an ischemia, properly speaking—but the blood thus driven from the arterial side accumulates on the venous side." Sponging the spine with water as hot as the patient can bear it, the sponge being drawn rapidly along the whole length of the spine for ten or fifteen minutes morning and night, with the daily application of an irritant to the same surface, does good in either the acute or chronic forms of the disease under discussion. Peripheral irritation surely has some effect upon the nutrition of internal organs, especially when these organs are placed in direct anatomical relation to the surface. The results published by Strumpf, of the treatment of spinal sclerosis by the faradic brush, are strong proofs of the power of mild peripheral irritation.

Galvanization has been proved to act upon the cord itself, and is one of the best agents that we have in the treatment of the chronic form of spinal troubles. Unfortunately, in private practice in the country it is impossible to use it in every case with that frequency and perseverance necessary to produce good results. In one case it seemed to aggravate the symptoms; in the few others in which it was used

* Medical News, Dec. 16, 1882, Clinical Lecture.

it was undoubtedly a help. Dry cups, placed on each side of the spine, once or twice daily, are means which should not be omitted in the treatment of any form of spinal congestion or inflammation. In addition, the patient should be placed in the best possible condition as regards his surroundings, diet, clothing, amount and nature of exercise, avoiding dorsal decubitus, but resting upon the side, or with elevation of the body, shoulders and head, as may be determined by trial to give the most relief.

There are other remedies of known value, but the above have been applied in the treatment of the cases considered in this paper.

ARTICLE XII.

THE ANNUAL DISCOURSE.

THE PHYSICIAN A POPULAR EDUCATOR.

BY JOHN CROWELL, M.D.
OF HAVERHILL.

READ JUNE 11, 1884.

THE PHYSICIAN A POPULAR EDUCATOR.

MR. PRESIDENT AND FELLOWS
OF THE MASSACHUSETTS MEDICAL SOCIETY:

WE live in an age remarkable for successful industry in every department of human skill and enterprise. Each day adds to the stock of man's inventive faculty in the curious mechanisms for the quicker and easier accomplishment of labor, and the splendid results are seen in every town and hamlet in the land. Material prosperity, as one of the elements of our civilization, is also shown in the colossal fortunes amassed in our great cities, and in the monuments of skilful labor that adorn our streets, and stretch from sea to sea in a net-work of iron bands.

We hear the almost boastful cry of the successful men, of vast financial achievements, and the lips of praise do swift homage to those giants who

NOTE.—At an Adjourned Meeting of the Mass. Medical Society, held Oct. 3, 1860, it was

Resolved, "That the Massachusetts Medical Society hereby declares that it does not consider itself as having endorsed or censured the opinions in former published Annual Discourses, nor will it hold itself responsible for any opinions or sentiments advanced in any future similar discourses."

Resolved, "That the Committee on Publications be directed to print a statement to that effect at the commencement of each Annual Discourse which may hereafter be published."

control great enterprises and hold the stock market in the palm of the hand.

Amid the devotion paid to the energy and the force that move this mighty machinery of business; amid all our admiration for the wealth that builds cities, founds schools, endows hospitals, and contributes to the thousand charities that appeal to our humanity, let us inquire into another phase of a nation's greatness,—the intellectual elements that shape the thought, and give direction to those movements without which material prosperity would work its own decay.

The present age is quite as remarkable for scientific investigation and philosophic research, for acute analysis and profound questioning, as for any material success and splendor. Against the achievements of the Rothschilds and the Vanderbilts, we place the Pasteurs, the Darwins, the Spencers and the Bains. Philosophy, Science and Philology are also the products of our time, and stand side by side, and quietly but firmly hold their own, with the more pretentious forms of success that mark the industry of man.

The exalted position of the medical profession to-day is largely due to the patient investigations of the scientist in the laboratory and with the microscope. While the great world has pursued its noisy way, the scholar has been busy in the recluse of his inner sanctuary,* solving those problems, and unfolding those subtle theories that

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* "The laboratory is the forecourt of the Temple of Philosophy; and whoso has not offered sacrifices and undergone purification there, has little chance of admission into the sanctuary."—HUXLEY—Life of Hume.

challenge our respect and admiration. Recent contributions to medical science form an epoch in our history. Who can estimate the value of that treasure-house, the chemical laboratory? What wonders in pathological analysis are daily unfolded by the microscope! How, by the invention and use of the most delicate instruments, can we detect the faintest indication of incipient disease! How, by minute dissection and a thorough understanding of the adaptation and relations of bone and muscle, fibre and tissue, some of the recent triumphs in operative surgery have been obtained! How broad and generous have become the modes of thought that give shape to our literature, and place our profession among the foremost of the learned systems of the world!

This is seen in the sharpness with which the investigations, and theories, and hypotheses of scientists are challenged by their peers. No sooner does Robert Koch startle and delight the medical world by his "Etiology of Tuberculosis,"* showing the result of a long series of microscopical experiments, than a score of enthusiastic investigators review his experiments, and out of Strickler's laboratory comes Spina,† with a series of investigations calculated to completely overthrow Koch's theory which had made so promising a foothold, denying by the same line of experiments his most brilliant conclusions.‡

* Die Etiologie das Tubercelose. Berliner Klin, 1882.

† Studien ueber Tuberculose. Wien, 1883.

‡ And what is this contest but a repetition of the profound conception of Aristotle,— that "Science begins when from a great number of experiences one general conception is formed which will embrace all similar cases."

To the physician whose experience stretches over a quarter of a century, the condition of medical science to-day is full of sharp contrasts. He compares the abundant facilities for preliminary study with his own scanty resources in the days of his pupilage. He visits yonder building* with all its generous spaces and magnificent appliances; he examines the curriculum with its wide range of general and technical study; he sees the system of teaching and the methods of illustration conducted from a broader basis of scientific research and investigation; he looks with admiration upon the enthusiasm of the student, as, with an honest emulation, he works in the laboratory or in the dissecting room; and he mentally exclaims, "Would that I were young again, to revel in all this wealth of advantage and opportunity!"

But this evolution in medical teaching is but the outgrowth of humble beginnings. The foundations laid by the fathers were well laid, and, year by year, we have witness of their wisdom, and zeal, and patience in preparing the way for these larger results.

How redolent of honest praise are the names of Warren and Jackson and Bigelow. What a debt of gratitude we owe to those great lights in medical science that have just disappeared from our horizon. How universal is the homage paid to the genius of Sims, and Parker, and Gross, whose wise and profound teachings, combined with the

* New Building of the Harvard Medical School, Boylston St., Boston, dedicated Oct. 17, 1883.

labors of our eminent living teachers, have shaped the methods, and guided the research of modern thought and investigation;

> "With truth's directness, meeting each occasion,
> Straight as a line of light!"

The example of the University in establishing a sounder system of medical education, has been productive of wholesome results. And, inspired and impelled by the example, the other great medical schools of the land are revising their courses of study, and broadening and deepening their methods of instruction. So that the ambitious student, desirous of obtaining a thorough preparation for the great duties of our profession, finds the doors of science wide open to invite and to receive him, that she may unfold her mystic stores.

As the preparations for the work of the profession are so ample, as the avenues to success are so full of dignity and honor, how steadfast and noble should be the allegiance to the hand that has led us on. For, as Lord Bacon expresses it: "I hold every man a debtor to his profession; from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavor themselves by way of amends to be a help and ornament thereto."*

The physician, by the special discipline for his work, and by the delicate relations he sustains to his patients, enlists confidence, and his opinions carry the weight of authority. He stands at those gateways of anguish that open and close upon

* Maxims of the Law, Preface.

mortal life. His fingers are upon those delicate keys whose slightest touch vibrates through a thousand strings. His well-attuned ear detects the faintest discord in the vital harmonies, and the varying phases of morbid action cannot escape the searchings of his aided vision.

But there are relations of a more general character that demand our attention. The great public is ignorant upon matters of vital interest, and it may not be unprofitable to use the indulgence of this hour and consider the attitude of the

Physician as a Popular Educator.

What, then, are some of the topics that claim attention in our *general* relations to the community? Foremost stands the prolific question of Sanitary Science.

The literature of hygiene has been scattered broadcast over the land during the last decade. Science has been busy in unfolding to the public the more common sources of disease as found in house-drainage, and in the ordinary methods of disposing of sewage. When the modern system of household appliances was first introduced into our dwellings, we were so fascinated with the ingenious contrivances that they found a ready place in every part of our houses. Bedrooms, passage-ways, and halls were adorned with the glitter of marble basin and plated faucet, while convenient bath-rooms opened directly into the sleeping apartments of guests, without much reference to the character of the plumbing or the construction of

sewers. As a result, fine residences became the receptacles of filth distributed in an ingenious net-work of piping, as if contrived especially for the introduction of disease from cellar to attic.

This condition has been largely modified by the intelligent oversight of Boards of Health, and under the guidance of our State Board rapid strides are being made toward the remedying of many popular delusions. Still much ignorance prevails concerning the simplest rules of health as respects domestic arrangements, and the physician by his familiarity with the location and the construction of houses, can, by timely interference, reform many grave errors, and prevent their repetition in newly constructed homes.

The ambitious and successful business man, anxious to build a fine house, is apt to leave the plan of its construction entirely to the architect, who too often concentrates his thought upon the æsthetic aspects of the structure, so appealing to the eye, and so gratifying to the taste. The essential provision for plumbing and drainage is dealt with as of secondary importance, and the house of our friend and patient which we are expected to praise and admire is full of the results of bungling plumbing, and leaky pipes and a damp cellar unconsciously defile and dim the pretentious beauty of drawing-room and hall.

Says a recent writer of high authority in sanitary science,—" The majority of even the best houses are now very badly drained, and are subject to the production of sewer-gas at many points between

the outer wall of the house and the fixtures within it. Occupants are generally careless or ignorant of this fact, and the verdict of 'my plumber' is still considered by the average house-owner a sufficient certificate of good sanitary condition. Large traps clogged with accumulations of putrefying kitchen waste, soapy compounds, fæcal matter, etc., are still the rule rather than the exception."*

Said Hippocrates, two thousand years ago, "a dry soil is essential to health." Yet professor Chandler declares that not one house in a hundred in New York has a properly constructed cellar, which, he contends, explains the large proportion of deaths from consumption, and the prevalence of rheumatism in that metropolis. Sewer connections are usually made with tile drains, which are rarely tight, and hence they seriously pollute the soil. These cellars are crowded with all kinds of domestic rubbish, and often we find open water-closets for the servants in close proximity to the air box which feeds the heating apparatus. How many refrigerators have their drip-pipes connected directly with the house-drain! How often are cisterns and water tanks exposed to like pollution! How often are the spaces behind the wood-work of basins, sinks, and other fixtures, foul with dampness, mould, and the accumulation of filth! All the leading cities of the country are guilty of the grossest neglect in the simplest details of domestic drainage and sanitary appliance. We hear the

* "Sanitary Drainage," North American Review, August, 1883. George E. Waring, Jr.

same reports from Brooklyn, Philadelphia, Chicago, and San Francisco.

In our own metropolis of Boston these defects are painfully apparent. Recent reports assure us that many fine residences in the Back Bay region are deficient in sanitary safeguards. Hundreds of houses are built upon piles in made ground. In the process of settling, which may continue for years, the drains become dislocated, and this permits sewage to saturate the foundation and subsoil. "I have known," writes a standard authority,* "seventy-eight cart-loads of earth polluted in this way to be taken from under a building in the city of Boston." Official reports tell us that of three hundred and fifty-one houses examined in Boston in 1878, fifty-five per cent. of the drains were imperfect.

In Chicago, out of seventy-five houses where diphtheria occurred, only four were found in a sanitary condition; and in St. Louis, Health Officer Moore reported, in 1879, that there was probably not a single house with perfect drainage, while in a vast majority every sanitary rule was violated.

Not long since a successful business man invited his family physician to visit and inspect his new dwelling house built on the outskirts of a suburban city. The house was a "Queen Anne cottage," of the most approved pattern, picturesque in quaint gables and odd porches, and rich in the glow of color from tinted wall and painted glass.

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* Charles F. Wingate. "Unsanitary Houses of the Rich," North American Review, August, 1883.

The hand of the artist was everywhere apparent, and each adornment suggested a home of refinement and taste. After admiring all these elements of beauty, the medical friend was practical enough to inquire as to the disposal of sewage and the appliances for ventilation and heating. The owner of this "gem of a cottage" was quite oblivious on these points. They had been left to the plumber and the mason, with no personal or official oversight. It was found, upon examination, that the house sewage flowed directly into a cesspool situated in close vicinity to the house, and unprotected by any trap. The water-closets were supplied by pipes coming from the cistern containing the water used for culinary purposes, and the cellar was damp from the defective drainage of the clay bottom; and neither bath-room nor water-closet had any adequate means of ventilation. The satisfied owner was appalled when told that his beautiful home contained the germs of disease and death, and the good physician only regretted that his unwelcome detection had not been more timely.

How invaluable may be the suggestions and advice of the members of this Society in the location and the construction of dwellings, school-houses and factories. In a large factory in a neighboring city in this state, the water-closets furnished for the operatives on each floor were unprotected by traps, and, as there was no official inspection of the building, the fact was unknown to the owner of the establishment until an epidemic among the operatives directed the attention

of the resident physicians to the sanitary condition of the premises.

Since the passage of the Act of 1877, authorizing the establishment of local Boards of Health in the larger towns of the commonwealth, there has been a marked improvement in those localities that have availed themselves of the wise provisions of the statute. And physicians have rendered a noble work of self-sacrifice in organizing such Boards, and consenting to remain in official position until a good working system could be secured.

But many of our communities have not yet established such Boards, and the smaller towns cannot have the advantages of a complete organization. It is here that the physician can render most efficient work by personal instruction to his neighbors, in feasible methods of water supply, in local drainage, in household cleanliness, and in those minor sanitary details which pertain to the order and the decencies of life.

To what kind of places do we send our patients in the summer months, for the tonic influences of the blessed air from mountain or sea? Are we careful to inspect the premises and acquaint ourselves with the sanitary conditions of these resorts? How often are they deficient in the simplest rules of cleanliness, with privy, pig-sty and well in convenient proximity to each other, while frequently, especially in the farm-houses, the dark and unventilated cellars are reëking with the odors of decaying cabbage-leaves and musty

cider barrels. At a favorite sea-side resort last summer, typhoid fever made its appearance in one of the "cottages," when it was found that the victims had been drinking water from a well percolated and poisoned by sewage from a defective drain-pipe.

Typhoid dysentery often appears at the old farm-houses to which we send invalids, and we find too late the stagnant pools of sink-water and the damp and filthy cellar. These vicious conditions will be remedied when we lift up the warning voice, and declare that no patronage shall be given to any resort, however popular, that does not comply with the wholesome and simple rules of sanitary science.

Is the question, "What do we eat," too trivial to arrest the attention of the physician? The people of New England are far behind the rest of the civilized world in the practical accomplishments of the culinary art. In the bustle and hurry of our busy population, but little attention has been given to the sanitary conditions of cooking, and there is much of truth in the assertion, that a French cook will make a nutritious dinner from the remnants of food that we consign to the waste barrel. How rarely do we find good bread, even in families where there is abundance of provisions. How fondly do we cling to the conventional pie and doughnut, as if they were chief among the inalienable rights inherited from the fathers. We smile at the astonished Frenchman who exclaimed, "What

a people, a hundred religions and only one gravy!" And yet is there not a sound philosophical principle involved in this ejaculation, so far as the gravy is concerned? Most of our methods of cooking seem contrived to destroy rather than to conserve the nutritious elements of the animal fibre, the albumen, the gelatine and the fibrin. We have much to learn, not only from the French, but also from the Scandinavians as to the methods of preparing food that shall be palatable, nutritious and easily digestible.

When that intelligent observer, M. Taine, was visiting England, and inquiring into the methods of domestic life, he asked his host, "How do you cook vegetables in England?" "Cook them!" was the astonished reply, "why we *boil* them, how else *should* we cook them?"

In this connection, there is an important class of the community demanding our attention. I refer to the laborers and operatives in our large towns, who labor on the public works, and in the factories. Many of these hard-working people are in the habit of "carrying their dinner," which is of course eaten cold, and the contents of these little tin pails and baskets are richer in their variety than in nutrition. No wonder that we have been called a race of dyspeptics. He will be a benefactor to his generation, as well as "put money in his purse," who will devise a simple method of soup distribution among the operatives who depend upon this cheerless method of dining. With large tin cans, transported on hand-carts, hot soup

could easily be distributed by dextrous hands among the shops and factories, and for a few cents a comforting and sustaining meal could thus be furnished.

How often do we trace the sallow, attenuated look, the languid eye, and the feeble, inelastic step of many who seek our advice, to the lack of proper food at the proper time! How frequently are we obliged to attribute the complicated train of female diseases to the miserable methods of living in cheap boarding-houses, combined with the constant demands of manual labor!

We need more of chemistry as applied to cooking. The public must be instructed in simple methods of preparing food, so that the nutritious elements will be retained; and what better service can the practical chemist render, than to prepare a convenient hand-book for popular use, containing plain directions upon this vital subject? The philanthropist would substantially advance such benevolent work by offering a prize for the best treatise on practical cooking, for general distribution among cooks of every grade, from the elaborate culinary establishments of the homes of wealth, from the fashionable saloon, hotel and eating-house, down to the humble kitchen of the frugal housewife.

What kind of places do many of our business men occupy as offices where they make the money spent in the elegant houses where dwell the pets and the idols of home? Too often these counting houses and offices are found in dark, narrow streets,

and located in a basement, full of the stifling odors from ill-ventilated warerooms and cellars. Here are found clerks working by gas-light in mid-day, and the result is seen in the sunken eye and the sallow look and the shrunken muscle. Many such places exist in this goodly city, and the laws of mercy cry out for the protection of those who are forced to occupy them.

In the CONDUCT OF THE SICK ROOM, the services of the physician as teacher are of the first importance. It is here where ignorance will reign supremely, and with fatal sway, unless the firm and intelligent hand of authority interferes in behalf of the helpless and patient sufferers. In the furnishing of the room, in the disposition of air and sunlight and artificial heat; in matters of cleanliness in the clothing and in the necessary appurtenances, and above all in the *nursing*, the vigilant eye and the guiding genius of the medical attendant are among the essential elements in the successful treatment of disease.

In private practice as well as in hospitals, the physician should seek to have the furnishing of the sick room very simple, with as little of drapery and heavy carpeting as possible, and he should endeavor to secure ventilation and a proper adjustment of light by such contrivance as his ingenuity can suggest. The popular prejudice against air and sunlight has not yet faded from the face of the earth, and often the attendant will exclude both of these vital elements, as if they were the

cause rather than the antidote of disease. In the regulation of artificial heat a good thermometer in the sick room is all important, and its registration should be insisted upon by the physician, and *his* standard of cleanliness in the care of the clothing and the vessels of the room should be often held up as a guide, and, if needful, as a terror to the presiding genius.

It must be confessed that the average nurse, as found in our country towns and villages, is not the ideal guardian angel of camps and of hospitals, whose fairy shadow, as she flits along the corridors, falls like a benediction upon the helpless sufferers. The country physician has to deal with different material, and oftentimes his greatest embarrassment in the treatment of disease arises from the ignorance or duplicity of the nurse. In the larger towns and cities, and especially in the metropolis, this difficulty has been effectually met and overcome by the training of nurses in the hospitals, and a noble army of helpers is now in the process of this discipline, whose intelligent labors will add to the success of medical treatment wherever they are available.

But in the towns where hospitals do not exist, the trained nurse is almost unknown except in the most highly favored families. This vital want can be effectually met by the physicians of any given locality in the establishment of normal classes for the instruction of all women desiring the office of nurse, the physicians acting as teachers, under a system simple and elastic in its operation. In

these classes, instruction should be given in those essential duties of the sick room which ought to come within the province of every attendant deserving the name of nurse. The basis of such instruction and its practical working are most admirably and succinctly set forth by Prof. Jacobi, in an address delivered a year ago before the Mt. Sinai Training School for Nurses.* He says:—

"May I tell you what a good trained nurse may teach, and can teach? How to recognize a fever, how to compare the local temperatures of the several parts of the body, and how to equalize them; she knows that ever so many feeble children might have been saved, if but the feet and legs had not been allowed to get cold; how to bathe, when, and when to stop; how to regulate the position of the head—I remember quite well the case of inflammatory delirium which would always be relieved by propping up the head—how to treat intelligently an attack of fainting; how to render cow's milk digestible by repeated boiling, or lime-water, or table-salt, or farinaceous admixtures; how to feed in case of diarrhœa; how to refuse food in case of vomiting; how to apply and when to remove cold to the head; how to ventilate a room without draught; and a thousand other things. She will also use her knowledge and influence in weaning the public of nostrums, concerning which hardly anything is known except what you have to pay for the promises of the label. She will break the public of the indiscriminate use of quinia, with its dangers possibly for life; cure you of the tendency of making the diagnosis of malaria the scapegoat of every unfinished or impossible diagnosis; she will teach you that the frequent and reckless domestic use of chlorate of potassium leads to many a case of ailment, to chronic poisoning, possibly in the shape of Bright's disease, or to acute poisoning with unavoidable death. These are but very few of the things she can do, and but a little of the knowledge she cannot but distribute."

* Address delivered at the first commencement of the Mount Sinai Training School for Nurses, May 12, 1883. By Abraham Jacobi, M.D.

We might add to this enumeration, the ability to meet the many emergencies incident to the sick room. How to arrest a post-partum hæmorrhage, how to tie the umbilical cord, how to assist in administering anæsthetics in puerperal convulsions, and, above all, how to prepare the nourishment ordered by the physician.

Ask the ordinary nurse how she makes that popular decoction known as beef-tea, or how she prepares the artificial food that many infants are doomed to feed upon, and we shall find a lack of method and uniformity almost ludicrous. Here is where the training hand of the physician should be felt, and by actual object-teaching should he give the necessary instruction.

In those families where the limitations of poverty forbid the luxury of a nurse, the physician can do a timely service by the enforcement of a few simple rules for the relief of the suffering patient, and oftentimes he can introduce a system of attendance easily comprehended and followed. But what shall he do when he is confronted by the abodes of

"Poverty, hunger and dirt"?

—the haunts of idleness, shiftlessness and drunkenness; where the wretched offspring of disease and crime huddle together in the helplessness of want! It is here that he must assume the part of the philanthropist, and stoop down, and with pitying hands minister to God's suffering poor.

And can he not do more than this? Can he not, by his influence among the more favored classes,

assist in the establishment of a *system of ministration* that shall result in lifting up these wretched sons of want, so that the coming generation, at least, can have some appreciation of the decencies of industry and of cleanliness. It is a noble part of the ministry peculiar to our profession to be able to inspire hope, and confidence, and an honest industry among the descendants of families that for generations have sat in the "dark by-places," with no aspiration and no purpose. And in this way something effectual can be accomplished towards arresting the frightful mortality among the children of the poor.

A noble army of women is doing a benevolent work in relieving the *immediate* wants of these poor sufferers. But in the broader and more radical work of instituting a system of distribution that shall look to a *reformation*, the physician, by his intimate knowledge of the causes of poverty and suffering, must act an important part as adviser and educator. To him, in a special sense, belongs the duty of suggesting to charitable bodies plans of operation that shall secure those practical results so essential to the substantial success of free and generous giving.

The Ethics of this Society, in their relation to a certain class of medical practitioners, are grossly misapprehended by the public. People can readily understand why we can have no affiliation with the vulgar charlatan or the arrant quack, but they do not as easily comprehend our attitude

towards another class, composed largely of men of culture and high social position; men who, perhaps, were educated in the same schools and colleges, and who seem in all respects to be peers with the fellows of this honored Society. Representatives of other professions have not been slow in their strictures, and we have been charged with bigotry, narrowness and jealousy, because of our position in this relation.

Much of this criticism arises from the ignorance of the popular mind as to the causes that compel an adherence to the fundamental principle, that the practice of medicine has a basis as broad and liberal as science itself, and therefore it cannot be limited in its universal scope by any system based upon an *exclusive dogma*, and depending for its success upon the charm of a "distinctive appellation."

We might explain to all such critics, and without any compromise of professional dignity or of self-respect, that, from the very nature of things, these exclusive practitioners are the victims of their own environment; that, by the narrowing process of their own theory, they shut themselves outside the generous fellowship of liberal thinking, and take refuge within the walls that they have built. Is this the way that "star-eyed science" conducts her votaries? Is she exclusive? Has she secrets locked up and hidden from the search of universal investigation? Is it not time that the epithets "regular," "old school," "allopath," popular nicknames coined by the opposers of science, were discarded from our vocabulary and ignored for-

ever? We desire no other title than the simple, homely name of Physician, a term broad enough to embrace all that is desirable or possible in the art of healing; that recognizes every hint or suggestion of a liberal or intelligent experience; that receives into its vocabulary the nomenclature of the honest, patient investigator, and accepts new theories, even at the sacrifice of those long cherished, but no longer practical methods of the past.

Not long since, a member of this Society was entertaining a company of clergymen around his hospitable board, when the conversation turned upon that phase of our ethics relating to the discipline of certain members. "Why is it," said a leading divine to his host on this occasion, "that your Society pursues such a severe and illiberal course toward members who differ from you in methods of practice?" The genial doctor explained that the course pursued was based upon the same principle as that which governs all social compacts. "What would you do with a member of your religious body who denied the fundamental elements of your doctrinal statement; who assumed another and distinctive title based upon a speculation? And more than all that, who assisted in organizing and supporting a system whose principles were in direct opposition to those held vital to your existence?" "Do with him?" said the good minister, with commendable zeal, "We'd have him disciplined, and if he didn't repent and recant, we'd cut him off!" "That is somewhat like our position," was the quiet and convincing reply.

A gentleman of my acquaintance, in high position in the legal profession, whose sick daughter was attended by a homœopathic physician, was highly incensed when a member of this Society declined a consultation. The judge, who could adjust a knotty point of law, failed to discern the ethical relations of this case, and the only difference that he could see between the two practitioners was, that one was far more liberal and elastic in his practical methods than his conservative neighbor. He subsequently learned, however, that the cause of refusal was not based upon any narrow or selfish ground; that it did not depend upon the administration of large doses or small doses, nor upon the *belief* in any particular dogma. The fault was in the assumption of a title and the formation of an organization "distinct from, and opposed to, the medical profession."

Why not distinctly emphasize the statement, so that he that runs may read and understand, that the medical profession has no limitations except such as are made by science itself; that anywhere and everywhere a welcome is extended to all who comply with the benign and rational conditions of membership; that a profession based upon bigotry, narrowness or illiberality cannot exist under the searching light of the nineteenth century?

Prof. Austin Flint, in his admirable digest of the "Medical Ethics of the American Medical Association," uses the following language upon this important topic:—"The true ground for refusing fellowship in consultations, as in other respects, is

a name and an organization distinct from, and opposed to, the medical profession. Whenever practitioners assume a distinctive appellation, thereby assuming to represent an essentially distinct system of practice, taking an attitude of antagonism to the 'regular' profession, seeking popular favor on the ground that they belong to a 'new school,' based on truth and productive of good, whereas the 'regular' profession belongs to an 'old school,' based on error and productive of harm—how can there be fellowship, either in consultations or in other respects? If they who thus assume an attitude of antagonism to the medical profession conscientiously hold to the distinctive tenets which, as they profess, are the ground for their antagonism, how can they consistently desire to meet members of the latter in consultation; and, with opposing views of therapeutics, how could such consultations accomplish 'the sole object in view,' namely, 'the good of the patient?'" And he adds these terse words, which possess a significant meaning: "If, as is asserted, homœopathy has practically been abandoned by most of those who practise under this name, or so modified that the modes of treatment in cases of disease are not essentially different from those of the 'regular' profession, why retain the separate organization and the name, which imply to the public a radical therapeutic distinction? If the assertion be true, the name and the organization being retained, professional fellowship is rendered thereby immoral on the ground of complicity in a fraud upon the public."*

* "Medical Ethics and Etiquette," p. 47.

The attitude of the public in regard to the management of CONTAGIOUS and INFECTIOUS DISEASES is often at fault, and it is here where the timely interference of the physician is of vital moment.

Notwithstanding the rules and restrictions of Boards of Health, the grossest carelessness prevails, and exposure to diseases accounted contagious is encouraged by this easy-going negligence. Take, for instance, that much dreaded malady, diphtheria. Dr. Elisha Harris, of New York, in his report of the investigations made by him of the epidemic that occurred in Vermont in 1879, makes the following practical suggestions. "No other disease in our northern states has been more generally regarded as unpreventable, and none more capricious and fatally obstinate in its mode of prevalence, than diphtheria. Its apparently, and very probably, sporadic origin in numerous instances; its invasion of the most salubrious, as well as the most insalubrious quarters; its variable malignancy, and its rapid fatality in numerous cases wherever it prevails, have furnished ample occasions for the unsettled opinions and sanitary regulations which prevail in regard to this destructive malady. Medical men no longer reject the conclusion which experience has taught concerning the personally contagious attribute of diphtheria; but as this attribute is variable in its intensity in different cases and on different occasions, apparently, sanitary precautions and regulations adopted to extinguish or wholly control the virus of this disease are only occasionally applied and enforced." *

* Annual Report of National Board of Health, page 291.

This condition of things in relation to this disease, so carefully and so cautiously stated by high authority, has resulted in a deplorable looseness among all classes. Because the contagion of diphtheria differs from that of other well-known diseases in the character of inception and development, the public mind becomes indifferent to the suggestions of sanitary authorities, and in many localities we find an almost open defiance to all precautions. There is often no system of isolation during the prevalence of an epidemic ; there is gross neglect in the use of such disinfectants as are sanctioned by the best authorities; there is but little attention paid to the cleansing of houses, bedding and clothing; and, worse than all, there is a reckless disregard for the safety of the living in the disposal of the bodies of those who have fallen victims of the disease. Numerous instances could be cited where public funerals have been held, and the body of the dead child, bedecked with floral emblems in an open casket, has been followed to the grave by a procession of school children. This dangerous expression of sentiment finds encouragement too often by clergymen, teachers, and even parents, especially when the victim of the malady is a favorite child and very generally beloved. People need wholesome rules from the physician in the conduct of this disease, and, in the absence of local sanitary authority, his word must be potent in its explicitness, and with a savor of authority in its practical application.

There is another question growing out of contagious diseases that is engrossing no little attention. I refer to VACCINATION.

The public mind is somewhat divided as to the efficacy of vaccination as a preventive or modifier of small-pox, and also as to the danger attending the operation in transmitting certain loathsome diseases, more to be dreaded than the pest against which the prophylactic treatment is directed. In every little community, in every rural school district, there will be found men who will rebel at any attempt at compulsory vaccination, and oftentimes family feuds and bitter personal strife are the disagreeable results of an order for a general protection during a visitation of small-pox. Certain newspaper writers keep up the controversy, and sometimes a member of our profession widens the breach by the authority of his assertions, or by the sophistry that lurks in isolated statistics, and in the glamour of semi-professional nomenclature.

We frankly admit that the process of vaccination has been subjected to abuse, and that grave evils have resulted from the carelessness of the operator; for vaccination, like every other operation on the human body, demands care and skill in its performance. The evils of pyæmia and syphilis, which have ensued in certain cases, have been due, either to the use of a foul lancet, or of lymph, which, from remaining too long in the vesicle, had begun to decay, or from employing lymph mixed with the blood of a diseased subject. The evils of vaccination, then, can be easily avoided, and the remedies

are very simple:—a clean lancet, and pure lymph unmixed with blood or any other secretion. And since such ample facilities are afforded to procure virus from the cow, there need be no fear on the ground of vaccino-syphilitic inoculation.

And yet compulsory vaccination meets with stout opposition at home and abroad. The law in England demands that all children shall be vaccinated within four calendar months of birth; but this provision is so imperfectly fulfilled that, according to official reports, "the public defences against small-pox are in great part insufficient and delusive."* During the last session of the British Parliament the whole matter of compulsory vaccination came before the House of Commons by a resolution introduced by Mr. P. A. Taylor, member for Leicester, as follows: "That in the opinion of this house it is inexpedient and unjust to enforce vaccination, under penalties, upon those who regard it as unadvisable and dangerous." This resolution was supported by a speech of great vehemence, in which the whole system was denounced, not only as dangerous, but utterly useless, and, without taking the trouble to produce facts, Mr. Taylor dogmatically asserted that as "a factor in national mortality small-pox is nowhere at all."

It was for Sir Lyon Playfair to reply to these assertions, which he did by a masterly array of facts, too convincing to admit of controversy, and which are worthy of reproduction. A military surgeon testified before the committee of 1871, that

* Fifth Report of Medical Officer of British Privy Council, page 6.

of over one hundred and fifty thousand soldiers vaccinated, not one instance was on record of the transmission of disease by the operation. And of the 17,000,000 children vaccinated within the last thirty years, Sir Lyon challenged any one to produce four authentic cases that had been poisoned by a syphilitic taint.

And in further elucidation of his position he presented a concise array of facts showing the beneficial results of vaccination. These facts are so succinct that they are of practical value in meeting popular errors upon this vital topic.

In forty years after the introduction of vaccination into England the death-rate from small-pox had fallen from 3,000 per million to 600 per million, and after gratuitous vaccination had been ordered in 1841 the average mortality was brought down in thirteen years to 305 per million.

Again, when vaccination was made compulsory, in 1871, the ratio of fatality was reduced to 223 per million; while in Scotland, in 1882, the rate was only 6 per million. Remarkable results are also observed in the late Franco-Prussian war. The year before the war 40,000 French soldiers and 216,426 Prussian soldiers were re-vaccinated. There was not, however, time to re-vaccinate a large number of recruits who entered the French army from Brittany, where small-pox was prevalent. And the physician-general of the French army, Dr. Leon Colin, records, "That the different armies, raised in haste and placed in the field without time for re-vaccination, were exposed both at

their places of gathering and in their marches to the attack of the epidemic. The result was, that while 23,499 French soldiers died of small-pox, the mortality among the Germans did not exceed 263 deaths."

In London the deaths of the protected and unprotected are relatively 90 and 3,350 per million, while in America the deaths of the unvaccinated are 50 per cent. in Boston, 64 per cent. in Philadelphia, and 54 per cent. in Montreal; and among the vaccinated the mortality is from 15 to 17 per cent. At the conclusion of his argument, Dr. Playfair moved the following amendment to the resolution: "That in the opinion of this house, the practice of vaccination has greatly lessened the mortality from small-pox, and that laws relating to it, with such modifications as experience may suggest, are necessary for the prevention and mitigation of this fatal and mutilative disease."*

And this resolution was sustained by the remarkable vote, three hundred and two, while the anti-vaccination party mustered only sixteen votes.

It would seem, then, to be an easy matter to convince even the most skeptical that vaccination is a necessary means of defence against a terrible disease, and with Jaques in "As You Like It," the physician can confidently exclaim, with reference to this scourge of mankind:

"Give me leave
To speak my mind, and I will, through and through,
Cleanse the foul body of the infected world,
If they will patiently receive my medicine!"

* From Parliamentary Report published in the Boston Daily Advertiser, July 4, 1883.

What better service can the profession render to the community than to assert a well-defined polity against SUPERSTITION, EMPIRICISM, and QUACKERY?

The medical world has been more or less under the sway of superstition from the time of the early Egyptians to the latter part of this nineteenth century. During the highest period of Grecian civilization the disciples of Æsculapius depended upon feasts, fastings, and religious ceremonies for the cure of disease. The Romans combated the plague by incantations to the gods in the temple of Jove. The early Christian church believed that the power to cure disease lay wholly with the bishops and elders by the use of a miraculous power, independent of remedial agents. In later times, kings and queens of England and Franee claimed the power of curing disease by the laying on of hands. Queen Anne touched the king's evil of Dr. Johnson, who was brought by his mother in his infancy for royal treatment by recommendation of a distinguished physician of Lichfield. And this kingly prerogative which prevailed through the Stuart dynasty, was afterward assumed by those of less note, who passed through all the stages of wonder-working power possible to a diseased imagination.

Of the multiplied forms of superstition that have come down to us as a legacy, some are too trifling and harmless to deserve attention. Let the Dr. Johnsons remain happy by always putting forward the left foot on entering a room, and allow

the college student the luxury of wearing a nutmeg strung around his neck as a talisman against disease. But when the foolish myths of an ignorant age are perpetuated and made to environ the pathway of a pregnant woman, and subject her footsteps to a succession of pitfalls and spring-guns; when the life of a young mother is made wretched by the old wives' fables of the dangers attending every period of lactation and dentition, it is well to challenge these miserable maxims and "call a halt."

Quackery does not always appear in the *rôle* of a mendicant who practises his base arts upon the unwary and the ignorant. It does not always flaunt its filthy rags and display the tawdry show of its stock-in-trade to the gaping crowds in the streets. It has other artifices and other devotees. It sometimes assumes the air of a gentleman and rides in a gilded coupé. It finds too easy access to the home of affluence and fashion, and the doors of the library and the boudoir open to its persuasive knock. It can adapt itself to all moods, and patiently lies in wait for the weakness and duplicity of suffering humanity. It is in such lurking and subtle form and garb that this foe to science and to humanity is most to be feared. And do we not sometimes find it seeking refuge behind the protecting seal of a piece of parchment?

It is a grim satire upon the pride and glory of medical science that the confidence of the great public in the power of specifics, as curative agents,

remains as strong as in the former days of alchemy and astrology. Perkins's tractors and Bishop Berkeley's tar-water are perpetuated in the long list of patent nostrums that come in like a flood and threaten to overwhelm the land. Colossal fortunes are amassed from the sale of vile concoctions whose virtues are set forth with all the glaring allurements of cheap art, and the convincing logic of those grateful people who, in turgid rhetoric, tell the suffering public of their ready relief from maladies which "regular physicians" had tried in vain to cure. What a piece of patchwork is man, with his garniture of liver pads, lung protectors, electrical belts and jackets! How is he guarded from all pulmonary ailments by alternate trials of stuffing and starving! How is he led captive by the invitations and warnings that confront him in painted characters upon every available rail-fence or rocky cliff in the land! How does the poor long-suffering stomach run the peptonized gauntlet, and barely escape destruction in the dreadful ordeal! And will not mercy cry out in pity for the helpless babies in their struggles with many of the preparations of artificial food? Denied the nourishment that nature so bounteously pours out, these poor victims of mercenary greed are stuffed with an ever-varying round of compounds that vie with each other only in the differing grades of worthlessness.

Empiricism not unfrequently appears in the itinerant lecturer, who, with an airy grace, exhibits

his credentials, and unfolds his manikins and his skeletons to the applauding public. And, having prepared the way by a generous course of free lectures, he plies his specialty with lucrative success, and then leaves his victims to wonder why they are not cured, while he is "over hills and far away" with his ill-gotten gains. And before the old-fashioned family doctor has finished making repairs on mutilated eyes and scarified organs of generation, or has found time to remove the pessaries and supporters, and liver-pads and electric belts, the annual visitant again appears, and finds new victims to his devices, with a generous patronage from his old dupes.

Massachusetts is far behind many of her sister states in the enactment of laws regulating the practice of medicine. While nearly every other state and territory have done something, more or less effective, in this direction, our own state is unprotected, and quackery in every form is practically unhindered in its imposition upon the public.

The State of Illinois has done noble service to science and to humanity by empowering the State Board of Health to regulate the practice of medicine, and this has been done so wisely and so efficiently that quackery and empiricism find but feeble foothold within its jurisdiction. From the admirable and exhaustive report recently prepared by Dr. John H. Rauch, the able secretary of the Board of Illinois, we gather valuable information upon the whole subject of "Medical Education,

and the Regulation of the Practice of Medicine in the United States and Canada." In the long list of states that have enacted laws of various degrees of force and effectiveness, the name of Massachusetts does not appear, while those states possessing *good* laws are North Carolina, Alabama, West Virginia, Illinois, Missouri, Minnesota, New Mexico, Wyoming Territory, Mississippi, and Louisiana.

The Illinois Board of Health did important service in the exposure, in November, 1882, of the fraudulent "Bellevue Medical College of Massachusetts," which issued medical diplomas under the protection of a law relating to "Manufacturing and other Corporations." And the officers of this "bogus" college contended that they had a legal right to issue diplomas and confer degrees without any restriction on account of study or professional attainments. The United States Commissioner, before whom the trial was had, held this plea to be valid, and dismissed the case with the following remarks: "The state has authorized this college to issue degrees, and it has been done according to legal right. The law makes the faculty of the college the sole judges of eligibility of applicants for diplomas. If the faculty choose to issue degrees to incompetent persons, *the laws of Massachusetts authorize it.*"

Such an outrageous possibility, under a law of Massachusetts, has been cancelled, and the state saved from further disgrace in this direction, by the passage, June, 1883, of an act forbidding any

corporation organized under the law referred to from "conferring medical degrees or issuing diplomas, unless specially authorized by the Legislature so to do."

Why should Massachusetts lag so far behind other states in the enactment of laws so wise, just, and humane? Laws, not primarily intended to protect the medical profession, but to stand between the public and the horde of vampyres that feed upon the life blood of their ignorant, superstitious and deluded victims.

Is it not the duty of the members of our profession to educate the popular mind into a right appreciation of this vital question, and so to enlighten our legislators as to induce them to enact laws that shall redeem the good old Bay State from the contumely of fostering, by her legislation, the basest kind of frauds upon her citizens?*

Such, then, Mr. President and Fellows, are some of the methods by which the physician can render service to the public. It may be unrequited service; it may be called drudgery, but it is the drudgery that comes from ministration and sacrifice. It is the service essentially belonging to the highest ideal of the medical profession; a profession which makes the most profound problems of scientific research subservient to the wants of suffering humanity; whose noblest teachers and specialists are found wherever misfortune and woe have sown the seeds of disease.

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* See Appendix.

It is a service scattered broadcast over the land. The same in the country doctor who toils among the hills of Berkshire, or along the sandy reaches of the Cape, as in the city practitioner who threads his way, not only among the homes of affluence, but also through the lanes and alleys—the "Ghettos of the poor." In the eloquent words of "Hyperion," the physician is the servant of the public,—"toiling much, enduring much, fulfilling much; and then, with shattered nerves, and sinews all unstrung, lies down in the grave and sleeps the sleep of death, and the world talks of him while he sleeps! And as in the sun's eclipse we can behold the great stars shining in the heavens, so in this life-eclipse does he behold the lights of the great Eternity, burning solemnly and forever."

APPENDIX.

LAWS REGULATING THE PRACTICE OF MEDICINE IN THE UNITED STATES AND CANADA.

Extracts from a Report presented before the American Academy of Medicine at New York, October 10, 1883, *by* RICHARD J. DUNGLISON, M.D., *and* HENRY O. MARCY, M.D.

The excellent laws now in force in West Virginia and Illinois have been taken as models, and although it has been found impossible to imitate them exactly, on account of local obstacles and local prejudices, the wedge has been entered, and some good results must inevitably attend the enforcement of the law. A letter recently received from Dr. Millard, the Secretary of the State Board of Minnesota, a State which has adopted restrictive enactments since the last annual report of your Committee, summarizes the general aspects of the best of these laws; and we may quote his remarks upon their provisions as particularly appropriate in this connection; especially as he has given the subject of medical legislation close study and attention:—

"I think," says Dr. Millard, "The law or 'Acts' now in force in West Virginia, Illinois, Minnesota and Missouri, the best, by far, extant in any of the States. These four States are governed by virtually the same law, and have a constituency of at least 15,000 physicians. Each Act gives the Board the power of deciding the diplomas of what schools they shall recognize, and of revoking the certificate of any practitioner for unprofessional conduct; also the power to grant licenses to non-graduates by passing the necessary examination to test their fitness. You will observe that the main features of the law of these four States make the Board the censors of the different medical schools, as well as the professional conduct of those practising within the jurisdiction of the different Boards. It is claimed by the enemies of this Act that it constitutes a 'medical autoc-

racy' of the Board, and that it may use its power very unjustly. There is no doubt that, if the act is administered by unfair men, this criticism is true. It is, however, noticeable that outside of a few '*commercial*' medical schools, the law gives the greatest satisfaction, and I have not heard a whisper of complaint. The profession in general and a few of our leading medical institutions recognize that this country is flooded with incompetent medical men. That the time has arrived to cry, halt! all will assert, but as to the means of bringing about the halt there is a great difference of opinion. That it will not be brought about by the colleges themselves the profession is satisfied, after the last ten years' agitation of the subject, and the example set by Bellevue and some others. In appealing to Legislatures to regulate this evil, I think the correct law should compel *all parties* to submit to an examination before practising in the State. Such legislation is, however, impracticable now, and next to this I think the Acts of the States I have mentioned the best."

The Mississippi State law, which was adopted in 1882, is stated, by an earnest observer in that section of the country,* to be on a par with that of Illinois, in its efficiency and practical working, and is said to have accomplished already all that its most sanguine friends could have expected. To quote his own language, "all practitioners in the State, as far as I am aware, of every grade, have cheerfully complied with its requirements. * * The pile doctors, down to the Indian doctor tramping around with his banjo and his calico gown, have given us a clear field. Their places are vacant, and their voice is heard no more in the land. Thus, already, in one season, thousands of dollars have been saved to the people of the State, to say nothing of other benefits." In Alabama, the diplomas of medical colleges confer no right to practise medicine in that State; the applicant must be actually examined by a Board appointed for that purpose. In Arizona and Pennsylvania, and in Washington Territory, the law is simply for purposes of registration; in Arkansas a bill providing that all practitioners should be graduates of reputable medical colleges failed, this year, to pass both houses of the Legislature,

* Dr. J. M. Taylor. *Miss. Valley Med. Monthly*, Feb. 1883.

and county boards of medical examiners, appointed by county judges, who may not be competent to decide as to the professional qualifications of their appointees, still continue to give certificates to applicants for permission to practise medicine in that State. Connecticut's very brief law is mainly intended for the punishment of itinerants. In Kentucky the law is a dead letter except in a few counties, and in Texas and Nebraska it is weak and ineffective.

Dr. Piffard considers the New York law a good one, but that it has one important defect, in that a perjury in registering is only punishable as a misdemeanor, and not as a felony. Oregon has had a bill before the Legislature every year, for ten years past, but it has not yet succeeded in attaining so desirable a consummation. In Tennessee, which has no law of this kind, the practice of medicine is said to be free to all; according to the authority of the Secretary of the State Board of Health, "Indians, Negroes, confidence men, and all that ilk, ply their 'trade,' with no restrictions whatever. Any man who claims to be a doctor *is* one; hence druggists who do not know enough to make a living, turn out as doctors, in full practice, before you know it. A farmer boy, too lazy to plow, reads an old work on practice, or 'Every Man his Own Doctor,' invests six dollars in drugs, and is a physician; and being a 'regular' we all consult with him. Our legislators will not touch, and our doctors are too timid to press, the subject; and so we languish in the old paths."

It may well be asked by us, as a committee watchful of the progress of the times, whether, in States like this, which have imposed no restrictions upon the unlimited and unbridled practice of medicine, the experience of nearly four centuries has seen any marked change from the days of King Henry VIII. to the present hour;* for we read in the preamble of an Act, passed in England in the year 1511, looking to the regulation of the practice of physic and surgery, that its adoption was rendered necessary by the fact that "the science and cunning of physick and surgery is daily, within this realm, exercised by a great multitude of ignorant persons, of whom the great part have no manner of insight in

* W. T. Bly. "Early English Medical and Surgical Legislation." *New York Medical Record*, September 1st, 1883.

the same; some also can read no letters in the book, so far forth that common artificers, as smiths, weavers, and women, boldly and accustomably take upon them great cures and things of great difficulty, in which they * * apply such medicine as be very noxious and nothing meet therefore, to the high displeasure of God, great infamy to the faculty, and the grievous hurt, damage, and destruction of many of the king's liege people."

Utah has shown her interest in medical legislation only by that provision of her penal code which punishes physicians who are drunk, and has been content with this measure of legislative protection of the people of that section of the country. A correspondent in Salt Lake City writes that "the inference is, that during the little time he is sober, he will not do much harm. As for the medical fraternity proper, I do not think any of them care for any law regulating medicine. I believe they are advocates of the doctrine of the 'survival of the fittest.'" Wisconsin might be placed in the list of those having a law to regulate the practice of medicine, but the title indicates that it is simply "An Act to prevent Quacks from Deceiving the People by assuming a Professional Title," and not really a law that may be classed in the same category as those mentioned previously.

ARTICLE XIII.

THE PLASTER-POSTERIOR SPLINT

IN THE TREATMENT OF

FRACTURES OF THE LEG.

BY GEORGE W. GAY, M.D.
OF BOSTON.

READ JUNE 10, 1884.

THE PLASTER-POSTERIOR SPLINT IN THE TREATMENT OF FRACTURES OF THE LEG.

THE ideal dressing for a broken leg must be simple, comfortable, cheap, readily obtained, easily applied and removed, and must allow a frequent inspection of the limb without disturbing the patient. It must be applicable to all cases; capable of correcting any and all deformities, and of retaining the fragments in the desired position for an indefinite length of time; not liable to produce abrasions or other mischief; and once properly adjusted it should require little attention during the progress of the case.

Such an appliance has never to my knowledge been brought to the notice of the profession, but the one that seems to combine more of the desirable qualities than any other is the plaster-posterior splint, which has now been in constant use at the City Hospital for several years, and which has become a standard method of treatment in that institution.

The splint is made of sheet wadding, a coarse muslin or crinoline, and plaster of Paris. It may be applied as follows:—The leg is washed and dried, and enveloped in the cotton, which has been torn into strips about four inches wide, sewn together, and made into rolls like an ordinary bandage. Enough should be used to protect the bony processes and tendo-Achillis from pressure.

A single layer of the guaze large enough to extend from the toes to above the knee is to be placed beneath the limb, closely wrapped about it, and cut so as to completely sur-

round it, with the exception of a space about an inch wide on the anterior aspect. This piece serves as a pattern by which the other layers, six or eight in all, are to be made. The muslin is to be slashed on each side opposite the point of the heel to allow the foot-piece to be brought to a right angle without forming clumsy folds. Other slashes may be required to make the dressing fit snugly and smoothly, and to prevent wrinkles.

Fresh plaster of Paris mixed with warm water to the consistency of cream is now to be thoroughly rubbed into each layer of the gauze, and the whole applied to the limb at once, moulded closely and carefully to it, and firmly secured with a common bandage. The fragments are to be held in their proper place until the splint has become sufficiently firm to prevent displacement, which with good plaster is not over fifteen or twenty minutes. In some cases this object may be accomplished by means of sand bags or pillows. In a few hours the outer bandage may be removed, the cotton wadding cut open with scissors, and the appliance is complete, and may be worn with comfort for several weeks.

A certain amount of judgment and tact is required to use this dressing satisfactorily, but no more than is necessary in the treatment of fractures of the leg by any other method. A little experience will enable any one to become familiar with the practical details of applying this bandage, and the field of its usefulness will be found to increase in proportion to one's familiarity with it.

Particular attention is called to a few points in adjusting this plaster case. The greatest pains should be taken to hold the fragments in their proper position until the plaster sets, otherwise they may get displaced, when a new bandage will be required, or a deformity will be the result. The foot should be placed at nearly a right angle to the leg, especially if the fracture is at, or near, the ankle joint. Little padding is required except about the heel and malleoli. Care should

be taken that no wrinkles or folds be allowed to press upon the limb. The splint should reach the metatarso-phalangeal articulation below, and, as a rule, should extend above the knee, particularly in children, to prevent twisting of the fragments in their long axis, or, in other words, to hold the foot in its natural relation to the knee. It should embrace about three-fourths of the circumference of the limb in order to give the desired support, and to retain itself in position.

This dressing is especially adapted to cases of simple fractures of the tibia, or of the tibia and fibula, which are not attended with serious injury to the soft parts, and in which no great amount of force is required to maintain the fragments in their proper place. It is very convenient in the treatment of these injuries in children. Applied under ether it is firm and solid before the patient awakes, and does not require frequent tinkering during recovery, as do many other appliances. The advantages of a dressing which does away with the pain and fright so commonly attending the ordinary treatment of fractures in children cannot be too highly appreciated.

Certain cases of compound fracture of the leg can also be satisfactorily treated with the plaster tray, if the soft tissues are not too extensively injured, and if the wounds be so situated that they can be exposed through apertures in the splint for purposes of cleanliness and local applications. For this class of injuries the bandage may be strengthened with strips of hoop iron, lined with oiled silk, and kept in position by means of straps with buckles.

Properly applied to the above mentioned classes of injury the plaster-posterior splint is comfortable and efficient; it is self-retaining; it holds the fragments firmly in position; it allows the patient to be moved, or to move himself without danger of disturbing the fracture; it permits the parts to be readily examined; being opened throughout its entire length the bandage accommodates itself to the

swelling of the limb without danger of strangulation ; it can be applied immediately after the accident, there being no necessity for waiting until the inflammatory stage has subsided ; it can be removed and readjusted with ease, and can be worn indefinitely.

The same rule in regard to opiates obtains here, as in all fractures, namely, they should never be given until the physician is reasonably certain that the dressings are doing no harm.

Contrary to the teaching of some authorities, the writer believes in frequent examinations of broken limbs until the fragments are so closely joined that they cannot be easily displaced. It must be a very exceptional case in which union is prevented by too much manipulation. Broken ribs and collar bones, though necessarily subjected to constant motion, almost always unite well. So do fractures complicated with delirium tremens, or excessive restlessness, or insubordination, in which the parts often sustain great violence.

If the physician would avoid deformed limbs, splint sores, and lawsuits, he must, by personal examination, keep himself constantly informed as to the position of the broken bones and the condition of the soft parts, even at the expense of considerable discomfort to the patient. Temporary pain caused in this manner is of little importance, compared to the life-long mental and physical distress which may result from an unnecessary deformity.

The susceptibility to pain differs so greatly in individuals that it is not safe to rely wholly upon their sensations in determining the compression of a bandage. I once saw a case of gangrene of the foot, the result of a tight bandage, in which there was never any suffering. The only safety lies in watching the circulation of the toes, and in making careful examinations of the limb, being guided to a certain extent by the sensations of the patient. It is to be remembered that some persons with a fracture will always complain

of pain, whatever treatment is followed. As these patients generally eat and sleep well, and remain in good condition, opiates are to be given sparingly, if at all.

The position of the fragments encased in the apparatus under consideration can frequently be determined by simply sliding the fingers along inside the splint without removing it. But to thoroughly examine the parts the tray must be forcibly sprung open, and the leg carefully lifted out.

As plaster of Paris is brittle, and not elastic, frequent removals of the dressing tend to weaken it. Whenever it becomes loose from this cause, or from wasting of the limb, it may be tightened with straps, or a new one may be applied. In many instances one bandage is sufficient for the entire treatment.

It is not necessary to weary you with details of cases which have been treated by the above method. Suffice it to say that not infrequently this dressing is applied to fractures of the leg at the City Hospital within twenty-four hours of the accident, and not disturbed until the fragments are firmly united and the recovery is complete.

The results obtained with this method of treatment are probably no better than those following the use of side splints, fracture boxes, etc.; but there is a great saving of time and labor to the surgeon. There is not that necessity for a frequent readjusting of splints and bandages, which is so essential with most other appliances.

The writer wishes it to be distinctly understood that this dressing is not adapted to all varieties of fracture of the leg. For example, some cases of Pott's fracture accompanied by marked eversion of foot, requiring strong pressure to restore and retain it in its proper position, can perhaps be better treated by other methods. So likewise may those bad cases of oblique fracture of the tibia, the fragments of which override each other to a great extent. Severe contusions of the soft parts should not be subjected to pressure until all danger

of ulceration and sloughing has passed. The presence of blebs or blisters, however, does not necessarily preclude the use of this dressing, as they may often be treated through an opening in the plaster.

It has always seemed to me that those physicians who permit their patients to move about on crutches a few days after an immovable bandage of any kind has been applied to a recent fracture of the lower extremity, allow their enthusiasm to get the better of their judgment. The complications liable to occur during the repair of broken bones are so numerous, and at times so insidious, and suits at law for malpractice are so common, that in my opinion no adult should be allowed to move about until there is fair union of the tibia and fibula, which usually requires from four to six weeks, and very little weight should be put upon the limb for some time longer. There can be no doubt that deformity occasionally takes place in these cases from the patient's getting up too soon, while the union is green, thereby allowing the fragments to gradually yield under the weight of the body.

Those cases of fracture of the lower end of the fibula and rupture of the deltoid or internal lateral ligament of the ankle, accompanied with an outward dislocation of the foot, are often very difficult to manage, and require a longer confinement than any other simple fracture of the leg, three or four months being necessary in some instances to ensure sufficient repair to prevent future deformity. In some of these cases it is impossible to avoid a little eversion of the foot, whatever may have been the treatment, and however long it may have been continued. The writer has seen a recurrence of the dislocation after three months' confinement. He has also seen two or three cases in which the inner malleolus had been exposed by ulceration due to a return of the deformity, after a fair union had apparently taken place. He would never permit a person weighing one hundred and

fifty pounds to bear his weight upon a Pott's fracture under three months, and the greater the weight, the longer should be the period of rest.

A different line of treatment, however, is called for in some cases of fracture of the shaft of the long bones, more especially of the femur. When the union is imperfect at the end of three months or thereabouts, nothing does so much good as to encase the limb in an immovable bandage and get the patient up on crutches. The local irritation which results from this practice tends to excite the reparative process to that degree, that the fragments become firmly united within a comparatively short time.

In conclusion allow me to say, that while I do not think the plaster-posterior splint is adapted to all fractures of the leg, yet in the classes of cases specified in this paper I most heartily recommend it, hoping that a fair trial will convince some surgeons, as it has the writer, that the dressing combines more good qualities, and fewer bad ones, than any of the common appliances in use at the present time.

[A practical demonstration of the plaster-posterior splint was made before the Society by Dr. R. A. Kingman of Boston, who perfected and brought it into use in this vicinity while he was house surgeon at the City Hospital in 1881. The efficiency and popularity of the splint are largely due to Dr. Kingman's skill and ingenuity.]

ARTICLE XIV.

A CASE OF CHYLOUS DEPOSIT IN THE ABDOMEN.

By FRANKLIN NICKERSON, M.D.
OF LOWELL.

READ JUNE 11, 1884.

A CASE OF CHYLOUS DEPOSIT IN THE ABDOMEN.

THE subject of this sketch has been deaf and dumb from his birth, and his wife became so at the age of four years, the result of some injury. The two children of this union can both speak and hear. Our patient is fifty-five years old. He was born in Westford, Mass., in which place and Lowell he has spent his life. He has lived in Lowell thirty-two years, and for the past thirteen years in Bachelder's Place, which leads out of Walker Street at a point not far from Pawtucket Street—a locality which is sufficiently healthy. Up to fifteen years ago he had worked in a bedstead factory. Since then, till a year and a half ago, his occupation had consisted in finishing doors, in which a good deal of heavy lifting is required, especially in the handling of the hard woods; but notwithstanding this he has never had hernia. For a year and a half he has been employed in a cash-carrier factory, where his work is much lighter. He knows of nothing peculiar in his family history except that his father died of consumption. His height is five feet and three inches. His weight has varied but little from one hundred and five pounds since he attained to manhood. His general appearance is fairly healthy; his carriage is erect and firm, and his movements are quick and nervous. His figure is not muscular, and, though spare, is well formed, except that his abdomen is full for a person of his general build, and, as he says, has always been so. His complexion is light and his hair has been white ever since the age of

seventeen. He has been near-sighted for many years, has always been nervous, and has had only one testicle from birth. His general health has always been good, and he had kept steadily at work until the forenoon of January 15, 1877, when on account of a sudden attack of pain shooting from the lower part of his back directly forward through his abdomen, and accompanied by vomiting, he was obliged to give up his work and go to bed. The pain increased so that on the following day Drs. Savory and Fisk were summoned. They found the patient suffering from pain in a tumor, which, from its form, size, and situation led them to think that it was a distended bladder. The catheter was readily passed, but it withdrew only a few drops of limpid urine. Aspiration was then resorted to, which resulted in the extraction of about two quarts of milky fluid, with entire relief to the patient. After the aspiration the tumor collapsed to a level with the surface of the abdomen, and in a day or two the patient was about his work, apparently as well as ever. Throughout this attack there was no febrile action, no symptoms pointing to any organ, and no affection of the general system except nervous excitement from pain and fear of the operation, and some slight weakness for a day or two. The evacuations, both of the bladder and rectum, were normal. An experience like that just narrated was repeated on March 21 and October 3, 1877, and July 28, 1878, respectively, except that every recurrence of the tumor was preceded by an exacerbation of pain lasting for about three days, while the quantity of fluid diminished so that by the last aspiration scarcely twenty ounces were withdrawn. I was present on this occasion, and can confirm the account of the case as given by the attending physicians. Some months after this the patient noticed a partial refilling of the tumor, and a subsequent retrocession thereof. The aggregate amount of fluid aspirated was about five quarts. After the first aspiration up to

a year and a half ago he was subject to a dull ache in the lower part of the back, which was easily converted into a severe pain, shooting forward to the site of the tumor above described, by long walks or riding. This pain was also brought on when, having a desire to go to stool, he did not satisfy that desire at once. He had at times, also, some pain in the act of micturition. During the period just mentioned vomiting occurred at various intervals. The matter vomited consisted in the main of the same milky looking fluid which was taken from the abdomen; when the vomitus was profuse, general weakness followed for a few days. To these facts the patient, his wife and daughter, testify with the greatest confidence. The patient has always had an aversion to milk, and has never used it except sparingly in coffee. He dislikes fat, also. These are the only peculiarities observed in his diet. From the time of the first to the last aspiration the vomiting was less frequent and the milky vomitus less abundant than afterward, when these symptoms had increased to such a degree that the daughter called the attention of her physician to the fact. He asked her to bring to him a specimen of the vomitus if it should appear again, but this request was never granted. The pain and vomiting had been growing less marked up to a year ago last March, when his last attack of vomiting took place while he was at work. This attack was accompanied by a loose discharge from the bowels, in which, as well as in the vomitus, the milky fluid, as he says, reappeared. Ever since this time he has been well in every way.

A specimen of the fluid withdrawn by the first aspiration was brought to me a few hours after its extraction. Its general appearance was that of milk. After standing a few hours it exhibited a soft and generally diffused coagulum. Although some of the fluid remained in my office for a week in a temperature which ranged from 60° to 68° F.,

there were no signs of decomposition. It was odorless and its taste was mawkish. The reaction was alkaline, and the specific gravity was 1018. Ether extracted from it largely a clear yellow fluid, in which, on the addition of nitric acid, an albuminoid precipitate was thrown down. Under the microscope were seen large quantities of molecular granules, fat globules, occasional crystals of cholesterine and granular corpuscles of different sizes, in some of which nuclei were revealed on the addition of acetic acid.

A portion of the fluid was sent to Professor Edes, of Boston, who replied as follows:

"January 19, 1877. I received your very interesting specimen yesterday. It is, as you suppose, an emulsion containing very finely divided fat, like chyle, and granular corpuscles of various sizes and shapes, and fat globules, single and aggregated. Dr. Fitz found a little cholesterine. I found no cells, except those mentioned, to indicate in any way its source. Chemically, ether extracts a large amount of fat, bright yellow in color. It contains also a large amount of albuminous substance which precipitates with nitric acid, but also, after being boiled with alkali, with acetic acid, which would assimilate it more closely to caseine. I was unable to get a trace of urea or anything like urinary pigment. There is also no urinary smell."

Professor Wood, of the Harvard Medical School, thus writes in allusion, as I think, to some oral observations which he had previously made on some of the fluid which had been taken from this patient:

"December 7, 1878. I find nothing additional in my notes. The fluid was milky in appearance, and on being shaken with ether, was rendered nearly clear. This clear fluid contained a large amount of albumen. The ether left, on evaporation, a large amount of fat. The microscope showed oil globules and lymph corpuscles in large numbers."

Unfortunately, the fluid which was withdrawn by the last aspiration, and was sent to Professor Wood for a quantitative analysis, did not reach him till it was too old for examination.

In searching for precedents to the foregoing case, I am mainly indebted to Professor Busey, of Washington, D. C., who has written two volumes, one entitled "Congenital Occlusion and Dilatation of Lymph Channels," and the other, "Narrowing, Occlusion and Dilatation of Lymph Channels—Acquired Forms." A digest of the latter treatise, with some additions and modifications, may be found in the American edition of Holmes's "System of Surgery."

Georgevic, in Langenbeck's "Archiv. für Chirurgie," vol. 12, page 641, has written an article on lymphorrhœa and lymphangioma, and has illustrated his subject by a number of cases.

In Virchow's "Archiv. für Pathol. Anat.," vol. 64, No. 2, Dr. Weichselbaum, of Vienna, makes the discovery of a chylangioma cavernosum in the mesentery of the upper ileum the text for a summary of some contributions which had been made by different writers to the knowledge of lymphatic and lacteal pathology. There are also reports of cases relating to this subject scattered through various medical journals, but on the whole its literature is meagre.

In Professor Busey's work on the acquired forms of lymphatic disease, is found the following classification: First, anomalies and lesions of the thoracic duct; secondly, rupture of the lacteals and receptaculum chyli; thirdly, chylous effusions into serous cavities. The vices of formation are mere curiosities of the dissecting room. It is stated, first, that diseases of the texture of the thoracic duct are usually the result of infection through the smaller lymph channels; secondly, that diseases of the lymphatic apparatus show a tendency to degenerative processes, which have an enfeebling and wasting effect on the general system. It is evident, therefore, that we must look further than Professor Busey's first heading for analogies.

In an essay on dropsy by Donald Monroe, Lond. 1865, are found the following cases: (1.) In the body of a man

who died after a large quantity of chylous liquor had been let out of his thorax, was discovered, about the third or fourth vertebra, an orifice from which the chylous matter flowed as from a fountain. When the lower part of the thoraic duct was blown into, the air came out at the above mentioned orifice. (2.) A girl made too great an effort to raise a burden, and became hydropic soon after. Being frequently tapped, there always issued from the puncture chylous matter. (3.) Hydrops lactea in a boy two years of age, which after his death was found to have been caused by a large number of indurated tumors which compressed the thoracic duct, and had been the cause of a rupture of some of the lacteals.

Percival in his essays medical, vol. 1, Lond. 1788, reports the case of a girl who had ascites, and was anasarcous. Four quarts of a milky fluid were withdrawn at the first tapping. After the second tapping she recovered her appetite and strength. Percival suggests that she probably ruptured some lacteal by unusual exercise after a full meal.

Quincke, in the Deutsches Archiv. für Klin. Med., vol. 16, page 121, reports a case of effusion of chyle into the right pleura from a ruptured chyle-vessel in a man who had been run over by a wagon.

The Gazette Medicale de Strasbourg (see translation in Jour. Amer. Med. Assoc., Aug. 4, 1883) describes a case of abdominal dropsy in which there had been eight tappings in four months, and each time four gallons of milky fluid were withdrawn, which Professor Rechlinghausen decided to be chyle from rupture of lacteals of the intestines or mesentery.

Dr. Mastin, in a subject affected with chylocele (see Amer. Med. Weekly, Louisville, Ky., vol. 2.), found the patulous mouths of three or four lymph vessels, which discharged the fluid that filled the cavity of the tunica vaginalis.

From the preceding summary, and from sources elsewhere studied, we find that effusions of chylous fluid have taken place in various parts of the body, and that ruptures of the lacteals have been either seen or diagnosticated, but that from an anatomical standpoint a distinction must be made between deposits of true chyle and what, for want of a better term, we may call chyloid deposits. Two classes of cases illustrate this point of distinction: First, milky deposits in parts near the lacteals, e. g., the abdomen and thorax; secondly, similar deposits in parts remote from the lacteals, for example, the labia majora, thigh and ankles. The anatomical difficulty of remote deposits is explained as follows.

Roberts maintains that the secreting structures in these cases are anatomically related to the lacteal and lymphatic tissues, which, in consequence of their hypertrophic development, have acquired the property and function of the cells lining the lacteal ducts and glands. Petters offers the theory that the chyle-like fluid arises from the fatty degeneration of the endothelium and other form elements, and in the decomposition of protein substances, which processes are brought about by the stagnation of lymph. Fetzer ascribes the phenomenon to the absorption of the surrounding adipose tissue by the lymphatics.

A comparison of the chemical and microscopic analyses made in our own case and in other cases of chylous effusion, the proximity of the tumor to the chylous centres, the suddenness of its first appearance and the locality of the pain, suggest the idea that the fluid obtained from our patient was chyle from ruptured lacteals, and that this rupture may have been due to a strain in the abdominal region, possibly on vessels already distended; for although there is no history of any special wrench at this time, it is notorious that the patient's work had been altogether too heavy for him.

In only two instances do we find mention made of the

aseptic character of the chylous fluid, namely: Quincke's case, above quoted, in which the fluid extracted by ether remained fourteen days without any change in looks or smell; and Dr. Weaver's case, reported in Med., Surg. and Pharm. Repository, Aug. 1814, in which the milky fluid was kept for several weeks without any appearance of decomposition.

The symptom of chylous vomiting finds a single precedent in the New England Journal of Med. and Surg., vol. 12, page 4, in which we read the following record: "Dr. Sprague was called to see a man who, while on duty as a sailor, being previously in good health, had been suddenly seized with a severe pain in his stomach and bowels and across the lumbar region, accompanied with the puking of a great quantity of chyle, looking like frothy milk. He was pulseless, deathly cold and pale. The fluid was discharged without effort. The quantity was variously estimated, by some as high as one gallon."

As to the symptom of chylous discharge from the bowels, we have only the testimony of the patient himself, but it seems not improbable, if we admit the simultaneous occurrence of chylous vomiting. There is no history of repeated loose discharges, as was the case in the diarrhœa chylosa of the old authors.

Perhaps the most remarkable features of our case are, first, the apparently perfect recovery after so long a continuance of chylous phenomena; secondly, the repeated drain of chyle from the system without any appreciable loss of flesh or strength. But perhaps the drain was not large enough to produce these effects. All other cases that we have examined, where the loss of chyle or lymph has been abundant, have been attended with marked prostration. By abundant loss we mean the repeated removal of quarts; for example, the case of Recklinghausen, above described, and that reported by Saviard, in which from July 2, 1869,

to March 4, 1870, paracentesis was performed twenty-two times, and 289 French pints of chylous fluid, in the aggregate, were withdrawn.

But into whatever speculations we may be led concerning causes and symptoms, in the absence of that best of all diagnosticians, a post-mortem examination, we may safely decide that what we have to deal with here is not malignant or organic disease, but more probably a mechanical lesion.

In conclusion, the case is submitted to the profession, with the hope that it may be a stimulus to farther investigations in the department of pathology which it illustrates.

ARTICLE XV.

SANITARY FOREST-CULTURE.

By J. F. ALLEYNE ADAMS, M.D.
OF PITTSFIELD.

READ JUNE 11, 1884.

SANITARY FOREST-CULTURE.

THE subject of Forestry, involving as it does important considerations of public health, is not unworthy of the attention of this Society. Although a love of trees has always existed as one of the better instincts of mankind, it is only within comparatively few years that the evils resulting from the wholesale destruction of the forests have become so well understood as to result in active public measures for their prevention. Out of the necessity for overcoming these evils have arisen the science and art of Forestry, whose two-fold aim is to prevent the destruction of the forests from being carried to a dangerous extreme, and to reproduce in part those which have already been destroyed. The subject, which was formerly viewed chiefly from an economical point of view, is now, as recent observations bring out more clearly its sanitary aspects, naturally regarded by the medical profession with increasing interest.

The beneficial influence of forests upon public health is chiefly exerted in three ways:

1. By regulating the flow of streams.
2. By modifying the climate.
3. By protecting against malaria.

Under each of these heads a great number of interesting facts have been collected, of which the briefest possible summary will be presented.

1. It is well known that a piece of woodland acts as a reservoir, a large portion of the rainfall being held by the

roots and spongy soil, from which the sun's rays are excluded, thus keeping the springs alive, and storing up water to feed the streams during the dry season. On open ground the snows of winter chiefly expend themselves in spring freshets, while the snow which falls in the woods melts slowly, and is chiefly absorbed by the unfrozen soil. When, therefore, a country is denuded of its woods, the rain which falls upon it is wasted, running off in destructive floods, washing the lighter soil away from the hillsides, overflowing the valleys and doing a vast amount of damage; while in summer the springs dry up, the streams are shrunken, and those great areas which had been overflowed become dry. A large territory in the southeast of France, once fertile and prosperous, has from this cause become desolated and almost depopulated, and all the rivers of Europe are subject to greater fluctuations than formerly. The same has been observed of the rivers of India, Tartary and both continents of America. In the United States the increase of both floods and droughts is strikingly apparent. Wherever forests have been allowed to grow up again, on land once cleared, the springs have been found to reappear and the streams which they feed to regain their regular flow. Of this many instances might be cited, only one of which, as possessing a somewhat peculiar interest, will be mentioned as an example. It is stated by Surgeon Curran (Note 1), of the Indian army, that the brook Kedron, in Palestine, which has in modern times been nearly dried up, "has recently for the first time in centuries flowed in a copious torrent, evidently in consequence of the numerous enclosures of mulberry and olive groves made within the last few years by the Greek convent." The prejudicial effects upon health of great fluctuations in the level of streams are sufficiently apparent. There must result great variations in the level of the subsoil water, which are recognized as a fruitful source

of disease, and also, dependent upon this, great variations in the depth of water in wells, an important factor in the propagation of typhoid fever. Moreover, the alternate overflow and drying of low lands affords the very best conditions for the development of malarial diseases, in those regions where the malarial poison exists, and offer the most inviting field for its spread beyond its accustomed limits. Among the causes of the recent epidemic of malarial fevers in Connecticut and portions of Massachusetts, the cutting off of timber from the mountains must be recognized as an important one, for hence the rivers suffer an extensive overflow every spring, while in the summer they are so dried up as to expose a large portion of their bed to the sun's rays. The malarial poison has reached its greatest intensity and has spread most widely in certain seasons of extreme low water.

2. *The influence of forests upon climate.*

A piece of woodland exercises upon temperature an influence resembling that of the ocean, cooling the air in summer and warming it in winter. It also presents a mechanical obstacle to the violence of winds, besides depriving these winds of the character of excessive heat, cold, moisture or dryness. Thunderstorms are less violent in wooded than in open districts, the trees acting as electrical conductors. Forests are also believed to increase the rainfall. The experiments of Dr. Anders (Note 2) show that the evaporation from a forest is greater than that from an equal area of water, twice that from an equal area of damp soil, and several times greater than that from dry soil. It would naturally be supposed that this excessive evaporation would, by increasing the degree of saturation of the atmosphere, increase the rainfall, and such has, in some instances, been found to be the case. In Lower Egypt, for instance, where twenty million trees were planted by Mehemet Ali and Ibrahim

Pasha, the rainfall has more than doubled within the life of the present generation. The same has been observed in Scotland, and also on the Island of St. Helena. But such is not the result of all observations. For instance, at Marietta, Ohio, where a record of the rainfall has been kept almost continuously since 1817, the rainfall has not been found materially changed, although the country in that vicinity, which was formerly heavily wooded, has now but thirty-three per cent. of woodland (Note 3). Such apparent discrepancies show the importance of multiplying such observations, and of taking into consideration all other meteorological influences. One point to be remembered is, that rain, being usually formed at a great height, sometimes one or two miles above the earth, the quantity of vapor from a forest may be carried by the wind a considerable distance before being condensed into rain.

3. *Protection against malaria.*

Of the efficacy of masses of trees for this purpose there can be no doubt. Malaria possesses an affinity for leaves, and those of the eucalyptus are believed by many to possess a peculiar power of neutralizing it. It is highly probable, however, that this influence is wholly mechanical, for the experiments of Tyndall (Note 4) show that all minute particles suspended in the air have a tendency to attach themselves to any surface. The air of closed boxes became, in three days, wholly free from suspended particles, all of which had attached themselves to the sides of the box. Various infusions of meat and vegetables introduced into such boxes remained for weeks and months unchanged, while the same infusions exposed to the general atmosphere speedily putrefied and became alive with bacteria. These experiments are mentioned as showing the probable way in which leaves remove from the air the elements of disease. In all malarial regions a belt of trees interposed between a swampy

place and a dwelling is known to be a defence against malaria. In Virginia, a few years since, the cutting away of such a screen rendered a residence unhealthy, which had always before been exempt from malaria. The freedom of the Dismal Swamp from malaria has been ascribed to the fact that it is covered with a dense growth of cypress and juniper trees. A century ago, Pope Benedict caused the woods to be cut down between the Pontine Marshes and Rome, against the remonstrances of Lancisi. As a consequence the malaria reached the city, portions of which became so fever-stricken that many people were driven away from homes previously healthy. (Note 5.) Within a few years the French in Algeria have greatly reduced the prevalence of malarial fevers by planting large numbers of eucalyptus trees about certain marshy spots. The same has been done with a like result in Southern France, in Corsica, in Spain, and also by Trappist monks in the Roman Campagna. (Note 6.)

To these sanatory uses of the forest must be added the restorative effect of a sojourn among the woods, as shown by the many invalids benefited by a trip to the Adirondack wilderness, the woods of Maine and Canada, and the pines of the Southern States; as well as the advantages derived from woods and groves near cities and towns, where children may spend an occasional holiday in the open air.

Although it is the design of Forestry, by introducing a regulated and systematic method of cutting, to render the supply of timber perpetual, without materially diminishing the present supply, yet the chief objection to forest preservation comes from those who fear that the lumber interests will thereby be injured. That this objection is not well grounded is shown in the fact that, under the present destructive method of cutting, some of our most valuable woods, notably the indispensable white pine, are becoming

scarce, and nothing short of a general and earnest attention to the subject of forest preservation can prevent their speedy extermination.

To ensure the protection of the existing forests and the reproduction, to some extent, of those which have been destroyed, it is essential to have—

1. A general diffusion of knowledge as to the injuries inflicted upon the country by the unregulated cutting down of the trees.

2. The enactment of such laws as will cause the care and replanting of forests to be systematically and intelligently undertaken, and also prevent forest fires.

3. The establishment of Forestry as a special branch of education, either in separate schools or in connection with agricultural or other colleges, for the training of skilled foresters to take charge of the timber lands.

In Europe there is no lack of interest in the subject, the necessity in the older countries being greater than in ours. Laws for the replanting and protection of forests have, since 1860, been enacted in France, Prussia, Switzerland, Italy and other countries. The work is chiefly carried on by the governments of these countries, liberal appropriations being made for the purpose, and a large force of foresters employed. For the education of these, numerous schools of forestry have been established, the greater number being in Germany and Austria.

In the United States the interest in the subject is shown by the organization of a Forestry Congress two years ago, at the meetings of which many valuable papers have been read. Several papers have also been presented to the American Public Health Association, and others have been published in popular magazines. The Agricultural Department at Washington has a Division of Forestry, the report of which by Dr. Franklin B. Hough in 1877 (Note 7) is

the most useful handbook on this subject, and which is still doing valuable work under Mr. N. H. Eggleston, for which Congress appropriates the paltry sum of $10,000 annually. In eleven states there are laws for the encouragement of tree-planting, either by offering a bounty for lands planted with forest trees, or by exempting such lands from taxation for a term of years. Seven other states have laws to promote tree-planting upon highways. In 1873 Congress passed an "Act to encourage the growth of timber upon Western prairies." (Note 8.) In the last census a great deal of attention was given to the forests, and the report by Dr. Sargent now in press will contain a vast amount of information on the subject.

In Massachusetts a law exists requiring such agricultural societies as receive state bounty to offer premiums for the raising and preserving of oaks and other forest trees suitable for ship timber. In 1878 an act was passed exempting from taxation for ten years lands planted with certain kinds of forest trees. In 1882 a law was enacted, entitled "An act authorizing towns and cities to provide for the preservation and reproduction of forests." (Note 9.) Under this act cities and towns may purchase lands to be preserved as forests. The title of such lands vests in the commonwealth, and the State Board of Agriculture is made a Board of Forestry, with power to appoint keepers, and to make improvements, though the expenditure in any town may not exceed the amount received for rent and sale of products.

The Massachusetts Society for the promotion of Agriculture has at various times, beginning in 1804, offered prizes for the cultivation of forest trees. One of these of $1,000 was paid in 1870 to the Hon. Ben. Perley Poore, of Newburyport. (Note 12.)

In 1872 Harvard University received a bequest from the late James Arnold, of New Bedford, for the purpose of

founding a professorship of tree-culture, and creating an arboretum in connection with the School of Agriculture and Horticulture at the Bussey Place, West Roxbury. Thus began the "Arnold Arboretum," which, under the care of Prof. C. S. Sargent, is destined to become an important centre for forestry education.

It is thus evident that Massachusetts has been a leader among the states in regard to Forestry, and yet the practical outcome of what has hitherto been done is not very great. The law passed two years ago was specially intended to effect the preservation of the Middlesex Fells and their conversion into a public park, with the double purpose of improving the water-shed of the streams and ponds in that vicinity and of maintaining a sylvan health resort. This is an important step forward, and yet the law is not likely to result in any general purchase of forest and waste lands by towns and cities. Such purchases would be most likely to be made for the purpose of improving a water supply; but the fact that the water supply of one town is very often derived from another town, while this law only permits towns to purchase lands within their own limits, renders the law of but little use for this purpose. The same objection will apply to the improvement of the reservoirs of manufacturing companies, since the streams which feed them seldom arise in the same town, and sometimes not even in the same county or state. It has been suggested that the state might charter forestry corporations, composed of manufacturers and others whose interests are involved, with power to purchase and hold large tracts of forest land; but the antipathy of our people to great land monopolies would doubtless render the passage of such a law impossible.

The benefits to be derived from forest culture are not sufficiently local in their character for such work to be assumed with the best success by either towns or corporations. The forests in one part of the state benefit the whole popu-

lation, especially in the ways which have been outlined in this paper, and therefore the wisest plan would be for the state to assume control of the forests, purchasing such lands of little value for farming purposes as may seem advisable, and planting them with forest trees. From these lands the state would in the future receive a revenue from the sale of timber, to be cut under such a system as to ensure the perpetuation of the forest. (Note 10.) To obtain the very best results such measures should be undertaken by all the states, and when a beginning is made by one or more states, others will be likely to follow their example.

Upon the hills of Western Massachusetts are thousands of acres of land, which, when first cleared, was sufficiently productive; but the soil, no longer held together by the roots of the trees, has had its lighter and richer portions washed out year by year, until its best elements have found their way into the valleys, leaving the hill farms sterile and nearly worthless. The change is evidenced by the ruined houses and half-obliterated cellars which are sadly abundant on the hills, indicating a population and prosperity in former times which would now be impossible. In the vicinity of Boston, within my recollection, many fine tracts of woodland have been cut down for firewood, leaving barren, rocky hills, looking desolate enough without their once beautiful covering. If these sterile hills, all over the state, could be planted with the best varieties of forest trees, and properly cared for, the value of adjacent lands would be enhanced, our streams would flow with greater regularity, freshets and low water would both be less common, the climate would be tempered, the extremes of heat and cold being less marked and winds less violent, the rainfall would be more copious and regular, malaria would lose its foothold, while every grove would be a sanitarium for the weary denizens of city and town. Let us as physicians do what in us lies to promote this important reform. (Note 11.)

NOTES.

1. "A Plea for Tree Preservation in India," by Surgeon Major Wm. Curran, A.M.D. Indian Annals of Med., etc., Calcutta, 1877, vol. xix. p. 59.

2. "Forests, their Influences upon Climate and Rainfall," by J. M. Anders, M.D., Ph.D. American Naturalist, Jan. 1882, vol. xvi. No. I.

"On the Transpiration of Plants," by the same author. Am. Naturalist, March, 1878.

3. See "The Sanitary Value of Forests," by Geo. C. Andrew, M.D., of La Porte, Ind. Trans. Am. Pub. Health Association, 1877.

4. "Floating Matter in the Air," by John Tyndall, F.R.S., 1882.

5. "Forests and Trees as Sanitary Factors," by John S. Caulkins, of Thomasville, Mich. Report Mich. State Board of Health, 1881.

See also, "Forests and their Climatic Influence," by M. Becquerel. Smithsonian Report, 1869.

6. Caulkins, op. cit.

7. Report upon Forestry, prepared under the direction of the Commissioner of Agriculture, 1877. This report is a mine of information. Dr. Hough also published in 1882 a valuable text book, entitled, "The Elements of Forestry."

8. U. S. Statutes at Large, vol. xvii. 42d Congress, 1873.

9. Acts and Resolves of Massachusetts, 1882, p. 200, chap. 255.

10. Private enterprise alone would accomplish much, if the art of making forest cultivation profitable were generally understood. In the three western counties of Massachusetts the planting of sugar maple trees would in time yield rich harvests of maple sugar.

11. Valuable works of reference, besides those mentioned, are the following:

"Trees and Shrubs of Massachusetts," by Geo. B. Emerson, 1846.

"Man and Nature," by Geo. P. Marsh, 1864.

"The Earth as Modified by Human Action," by the same author, 1874.

Also the following books by John Crombie Brown, LL.D:

"Forests and Moisture, or Effects of Forests on Humidity of Climate." Edinburgh, 1877.

"Reboisement in France." London, 1880.

"Pine Plantations on Sand Wastes in France." London, 1876.

"A special bulletin of the Boston Public Library in June, 1879, under the heading, "Trees and Forests," contained 180 titles.

A bulletin printed in connection with the meeting of the Forestry Congress at Washington, May 7, 1884, contains a list of 167 papers read at the previous meetings of the Congress during the past two years, of which a considerable number pertain to the effect of forests upon climate and health.

A weekly journal of Forestry, entitled, "Oesterreichische Forst-Zeitung," is published in Vienna.

12. Tree-planting on a large scale has been successfully practised by the late Richard S. Fay at Lynn, and Mr. Joseph S. Fay at Woods Holl.

ARTICLE XVI.

THE PITCH OF THE PERCUSSION SOUND.

By LEONARD HUNTRESS, Jr., M.D.
OF LOWELL.

READ JUNE 11, 1884.

THE PITCH OF THE PERCUSSION SOUND.

In this paper I shall not have time to dwell long on the subject of pitch in general, as I wish to confine my observations to two special matters which seem to me of interest.

The pitch of the percussion sound has been regarded as of little consequence until lately, and I do not think that sufficient prominence is given it to-day, except by a few writers. Auenbrugger barely alludes to the pitch of the percussion sound. Neither Laennec nor Piorry mention it. Locher pronounces it chimerical. Skoda considers the variations in pitch as of little practical value, although he admits that "it occasionally happens that the presence of tubercles in the upper part of the lung may be diognosticated by the different pitch of the percussion sound over the corresponding part of the other lung."

American and English writers lay no special emphasis on the importance of the pitch. French writers generally slight the subject, although Woillez considers it of more importance than the intensity or the quality of the sound. He says: "I place the pitch at the head of the important characteristics of the percussion sound." And again, "If up to the present time its importance has not been understood, it is because it has not been studied apart from its intensity."

Niemeyer expresses himself thus: "Although formerly this distinction (between high and low pitch) was treated

in such a neglectful (stiefmütterlich) manner, it is of much use to modern workers in percussion."

Stern says: "To-day, men of training are better fitted to distinguish differences of pitch than differences of sonorousness and intensity, and therefore it is evident that many medical investigators of abnormalities of sonorousness and intensity really perceive only the change of pitch."

The four elements of the percussion sound which should be studied with reference to diagnosis are quality, pitch, intensity and duration. I know that this is an unusual classification, but I am sure that it is the correct one. I have found it in but one of all the writers I have studied on this subject. Some writers recognize only intensity and quality as elements of the sound; others add to these two a third, pitch. Seitz alone considers the duration of the sound of sufficient importance to classify it as a distinct element.

The duration is not to be confounded with the pitch of the sound. The latter depends upon the number of sound-waves which strike the tympanum of the ear in a given time. The former depends on the length of time these waves continue to strike upon the tympanum, and of course can be considered only when the sound is produced by a stroke or blow, and not where the sound is caused by a continuedly applied force, as in wind and string instruments. The duration of the sound depends in part, to be sure, on the pitch, a high-pitched sound being, *cæteris paribus*, of shorter duration than a low one. Two sounds of the same pitch may, however, differ greatly in duration, as in the case of the long vibrating peal of the church bell as compared with the short beat of the drum, even though the pitch be alike in both cases.

The conditions, other than the pitch, which influence the duration of the sound refer in part to the substance of the body percussed, the duration being in direct proportion to

the elasticity and homogeneousness of this body. The medium surrounding the body percussed also affects the duration of the sound. Strike a bell suspended in the air gently, and note the duration of the vibration. Now immerse the bell in water and strike it more forcibly, so that the intensity of the two sounds shall be equal, and see how much sooner the vibrations cease. A third factor is the movability of the point or points of support by which the body percussed is held in place. The duration is directly proportional to the movability of this point. So *one* reason for the long continued vibration of the church bell is the fact that it hangs suspended in the air, with nothing but its weight to prevent it from swinging with every breeze.

I would urge upon instructors in Physical Diagnosis the importance of teaching duration as well as pitch, as an essential element of the percussion sound.

Of the three commonly recognized elements of the percussion sound, quality, pitch and intensity, I admit that in many cases the quality may be the most important and significant, and differences in quality in two sounds may be so marked as to be more easily distinguished than the difference in pitch or intensity. I think it, however, no more than fair to claim that as between the two latter the pitch of the percussion sound is of more aid to us in diagnosis than the intensity.

If, for example, you are comparing the two sides of the chest, it is impossible to percuss them with equal force. Even if it were possible, no one could be sure from which side the louder sound is elicited. The force of the percussion stroke affects the pitch comparatively little. The difference in pitch is something that any one with (I will not say a musical ear, for happily our ears are all with few exceptions musical) an ordinary ear can distinguish. Let any one strike a note on a piano twice in quick succession, the

first time somewhat more forcibly than the second, in the hearing of a company of unselected persons, and there will probably be by no means a unanimity of opinion in regard to the intensity of the note. Let him now strike two different notes, and probably the listeners can all distinguish the higher from the lower one. They certainly can if the two notes differ much in pitch. In the percussion sounds of the thorax it is not uncommon to have two sounds for comparison at least a fifth apart.

There are two characteristics always existing in the pitch of a sound, which aid us in our determination. A high sound is, as we have seen, of comparatively short duration. It is also of harder tone. A low sound is of longer duration and of softer tone. This always assists us in determining the pitch of a sound, whether we recognize the aid it affords us or not.

The first point to which I call your attention is the difference in pitch between the percussion sound of the right infraclavicular region and that of the left in the healthy thorax.

Several years ago I was taught by Dr. Guttmann, of Berlin, who follows Traube in this regard, that the pitch is higher on the left than on the right side of a healthy chest. All the instruction I had previously received on the subject had been the reverse. I therefore determined to ascertain what was generally taught by good authorities, and to make some experiments for myself.

To show the teaching of Dr. Guttmann, I will quote from his Handbook of Diagnosis: "In the normal thorax differences in the pitch of the percussion sound at different parts may be recognized by a cultivated musical ear; thus, on the right it is usually found to be deeper than on the left, though occasionally the reverse condition is met with."

I will compare this statement with the teaching of Dr.

Flint in his work on the Respiratory Organs. Referring to the infraclavicular region, he says: "In the majority of persons the resonance on the left side is somewhat more intense, the vesicular quality is more marked, and the pitch lower than on the right; per contra, the resonance and the vesicular quality are less and the pitch higher on the right side."

I have studied the literature of the subject with some care, and I generally find but little said concerning this point. By inference most of the authorities represent the two sides as alike in pitch; for example, when every region of the thorax is carefully discussed, and such a special point as the difference in pitch between the inner and outer parts of each infraclavicular region is brought out, no allusion whatever is made to a difference between the two sides.

We should not expect this point discussed by so early a writer as Auenbrugger, but I will call your attention to what he has to say bearing upon it: "If a distinct sound, equal on both sides and commensurate with the degree of percussion, is not obtained from the sonorous regions above mentioned (the thorax), a morbid condition of the parts within the chest is indicated." Corvisart, in his Commentaries, says: "It is a circumstance too obvious to be much insisted upon, that the percussion must be strictly similar and equal on both sides. The least sonorous side is certainly diseased." Of the American writers, DaCosta agrees with Flint. The others are silent on the subject. Most of the English writers whom I have consulted say nothing. Dr. R. Douglas Powell, however, affirms that "in the clavicular and infraclavicular regions the note should be even on the two sides as low as the third rib on firm percussion." French writers generally ignore this point, although Mailliot says: "The lungs percussed with equal force on the right and left side give the same result on one side as on the

other, from the apices down to the fourth rib." German writers, so far as I have studied them, are also silent here, except Traube, Guttmann and Seitz. The two former generally find the right side of higher pitch than the left, while Seitz finds that "in the axillary region in many cases the sound is relatively deadened (pitch raised) on the right side," thus agreeing rather with Flint.

On which side should we expect, *à priori*, to find the pitch the higher?

The height of the sound depends upon the volume of the air-containing body percussed (the lung), and also upon the tension of the chest wall and parenchyma, being inversely as the volume and directly as the tension. We may represent this by $H = \frac{T}{V}$. There is I think no doubt of the correctness of this formula, although Skoda says that the pitch is dependent entirely upon the quantity of air in the lungs, and Woillez thinks that he has demonstrated by the spiroscope that the pitch is not influenced, at least in every case, by the tension.

Other conditions may affect the pitch; as, for example, the condition and thickness of the chest walls, and the size and substance of the organs lying in juxtaposition to the diaphragm.

Flint, with regard to the infraclavicular, and Seitz, with reference to the axillary region, both think that the increase in intensity and the lowering of pitch on the left side may be accounted for, at least in part, by the transmission of sonorousness from the tympanitic stomach.

I do not see how Flint can consistently make use of this argument, for two reasons: First, the tympanitic sound which he thinks tends to a lowering of the pitch here, he asserts emphatically is always higher pitched than the normal vesicular resonance. Secondly, he teaches in the same work that whenever the intensity of the percussion sound is

morbidly increased (here by the tympanitic sound, as he says), the pitch is always raised.

All of the conditions, aside from the tension of the chest wall and parenchyma and the volume of the lung, exert upon the pitch a comparatively slight influence, I think.

There is no uniform difference between the tension of the two lungs recognized by authorities and laid down in text books. There is a difference in the volume, the right lung being the larger. Hence we should expect to find the pitch lower in the right lung in the majority of cases. Should we find the reverse to be true, we should conclude that the tension was greater on the right than on the left side, and, too, that the difference in tension exceeded the difference in volume.

I have been experimenting upon this matter for several years, and have given careful attention to the work. It is needless to say that all the subjects examined were in good health, and that special care was taken with reference to pulmonary disease. All cases of deformed and unsymmetrical thoraces were discarded, also all abnormally large or small ones. I percussed in every case both with and without the pleximeter, and I attended to two points which are often overlooked in comparing the percussion note of the two sides. First, care was taken in every case to percuss on points equally distant from the sternum, for in the regio-infraclavicularis externa the pitch is higher than in the regio-infraclavicularis interna. And secondly, percussion was made at the same period of the act of respiration, always at the close of a full inspiration.

Referring to the formula $H = \frac{T}{V}$, in inspiration, both numerator and denominator are increased, but the increase in tension of parenchyma and chest wall is greater than the increase in volume of the lung, and as a consequence the pitch is higher at the time of full inspiration than at any

other period of the act of respiration. At the close of a forced expiration the pitch is slightly lowered, although Stokes says, "A full inspiration makes the sound clearer, full expiration the contrary, but they both raise the tone a little, they render the pitch higher. Why is this? For the simplest reason in the world,—both actions tighten the drum. They strain the walls of the chest and render their vibrations quicker, and therefore the sounds higher." This, by the way, is the only allusion to the subject of pitch that this writer makes in his work on the chest.

I have had opportunity to examine only two hundred subjects; not enough, I know, to determine the matter satisfactorily, but still enough, I think, to be of interest to you. The persons were mostly men, thirty only being women. They were all between the ages of twenty and forty. I divided them, with reference to the results obtained, into five classes. *a.* Those in whom no difference was found in the pitch of the two infraclavicular regions. *b.* Those in whom the pitch was slightly higher on the right. *c.* Those in whom it was slightly higher on the left. *d.* Those in whom it was markedly higher on the right. *e.* Those in whom it was markedly higher on the left.

I will say here, that whenever I thought there might be a slight difference of pitch, but was in doubt about it, I placed the case in class *a.*

The result was as follows:

a. No difference,	72
b. Slightly higher on right,	71
c. Slightly higher on left,	26
d. Markedly higher on right,	23
e. Markedly higher on left,	8

At first glance this result might seem to be of little significance, but I do not so consider it. Out of two hundred cases, in but seventy-two, or but little more than one third,

is the pitch equal on the two sides. In ninety-four cases, nearly one half, the pitch is higher on the right than on the left. In thirty-four cases the reverse is true.

Now what is the practical bearing of this, supposing the work to have been well done, and considering the cases sufficient in number to be of value?

In the first place, a difference in pitch—and a difference in pitch means a difference in intensity and quality as well—at the apex of either lung, unless decidedly marked, does not necessarily indicate disease on the side where the pitch is higher. According to my investigation there is a difference in nearly two-thirds of the cases. This, however, is not generally taught.

Secondly, although the right side is much oftener high-pitched than is the left, still out of two hundred cases we have thirty-four, seventeen per cent., in which the pitch is higher on the left. So, although it is much more significant to find the left lung showing dulness on percussion at the apex than the right, yet this by no means is proof of disease, as I think is generally taught by those who make any distinction between the two sides.

While I was conducting these experiments, a friend made the criticism that to have the result satisfactory a resonator should be used, so that the pitch could be accurately determined. I do not agree with him. In that way every variation of pitch could be discovered, to be sure, and probably a slight difference would be noticed in nearly every case, but it would be of no practical value. What I desired to show was what could be discovered by an ordinary ear,—an ear musically uncultivated.

* * * * * *

There are so many unsettled questions in medicine that it would seem worse than useless to call attention to any point simply because authorities differ concerning it. If we

were to do that, we should have our hands full. But there is so much loose writing, especially concerning strictly scientific matters, in even the best medical works, that I think a protest now and then is needed. I desire to call your attention to the pitch of the tympanitic sound.

Dr. Flint, in his work on the Respiratory Organs, teaches that the pitch of the tympanitic percussion sound is always higher than that of the normal vesicular resonance, and he affirms that there is no exception to this statement. In his Manual of Percussion he says, "if there are any exceptions they are very few."

Dr. Loomis, in his Physical Diagnosis, says that the pitch of the tympanitic sound is lower than that of the normal vesicular resonance.

These statements, unaccompanied by any explanation, are taught as facts by two of our most widely read writers. They are diametrically opposed to each other, and I think I can show that, although the latter writer is, from a scientific standpoint, nearer the truth than the former, they both offer good examples of loose and incorrect writing.

The normal vesicular resonance is a good illustration of a non-tympanitic sound. The sound elicited from pulmonary cavities under certain conditions, and also the sound obtained by percussing the intestines or stomach when not too tensely inflated, are good examples of a tympanitic sound. The latter is a clear, ringing sound, with a musical tone, the sound-waves striking upon the tympanum of the ear at regular periods. The non-tympanitic sound is not a musical sound, the waves striking the tympanum irregularly.

Percuss a freshly removed sheep's lung without inflation, and you obtain a clear musical tympanitic sound. Inflate the lung to the degree of tension maintained in life, and the sound becomes less clear, non-musical and non-tympanitic. Here the pitch is raised. Or take a pig's bladder, just barely

filled with air, with no stretching of the membrane, and on percussion the sound is clear and tympanitic. Now inflate the bladder until the walls are tense, and the percussion sound is non-tympanitic, with a higher pitch.

According to Skoda and Niemeyer, and in fact according to authorities generally until quite recently, the relaxation of the chest wall and parenchyma was considered as the chief if not the only necessary condition of tympanicity of the pulmonary percussion sound, and the tension of these parts the sole cause of non-tympanicity. Tension of the membrane often destroys the tympanicity, to be sure, as the two examples just given illustrate, and as is seen in meteorismus of the bowels. In all these examples the pitch is raised. Tension does not, however, necessarily destroy the tympanitic sound, as is seen in the case of the drum. With this example before him, how could Skoda say that the stretching of the membrane necessarily destroys the tympanicity of the percussion sound? In many pulmonary cavities the tympanicity and also the pitch are dependent on other factors than the relaxation of the surrounding walls.

I have not space, however, to dwell on theories as to the cause of tympanicity, under all the different conditions with which it is met. I will call your attention to certain pathological conditions in which the percussion sound is tympanitic, and consider the question of pitch in each case.

Those conditions which favor retraction of the lung tissue often give rise to a tympanitic percussion sound, just as we have seen that the lung when removed from the thorax and allowed to assume its natural uninflated volume gives a clear musical tympanitic sound.

There are several pathological conditions under this head, but I will allude to only one, which is sufficient for illustration.

In moderate pleuritic exudations the lung above the level of the fluid shrinks in volume, and when this retraction reaches a certain point, which is variable in different cases, the percussion sound is tympanitic. In this case the pitch is lowered as the tension is diminished. Here the pitch of the tympanitic sound is lower than that of normal vesicular resonance.

If all cases where the sound is tympanitic could be thus easily disposed of, Dr. Loomis would be justified in his broad statement, for here the two sounds compared are both elicited from lung substance, and the tympanitic one coming from a lung of diminished tension is in consequence of lower pitch.

Without attempting to classify all the conditions which give rise to a tympanitic percussion sound, I will speak of a class of cases which are very different from that just discussed, and which obey different laws with reference to their pitch. I refer to the tympanitic percussion sound of pulmonary cavities.

In the first place, a cavity is either shut in completely by its walls, or it communicates by an opening with the adjoining tissue. If it is completely occluded, the air within cannot be set in vibration so as to produce an audible sound if the walls are stiff and unyielding. If the walls are sufficiently elastic to admit of the production of a distinct sound from the cavity, tympanicity will be present only in case the walls are not too tense.

The tympanitic sound obtained from a completely occluded cavity with elastic walls in a state of relaxation, obeys the same law of physics with reference to pitch as the non-tympanitic normal vesicular resonance. The height is directly as the tension and inversely as the volume.

If the cavity communicates by an opening with the adjoining tissue, the sound may be tympanitic with either

elastic or unyielding walls. If the walls are stiff and inelastic, the pitch of the percussion sound depends upon the volume of the cavity and the diameter of the opening of communication, being inversely as the volume and directly as the diameter of the opening. If the walls are elastic, the pitch of the sound depends on these two factors in just the same way, and also upon the tension of the walls, being of course in direct ratio with the tension.

There is also a general law with reference to the elasticity of the walls, that the pitch of cavities, *cœteris paribus*, is in inverse proportion to the elasticity of the walls. If a cavity is sufficiently long and narrow, i. e. if in form it is a tube rather than a cube, the pitch does not depend upon the volume of the cavity, but upon the length of the air-vibrating column, being in inverse proportion to this length.

It is true that the tympanitic sound of the abdomen is higher pitched than the normal vesicular resonance. This is not because it is tympanitic. You could with more truth say it is in spite of that fact. We have seen that in tympanicity from lung retraction the pitch is lowered. We have also seen that in the case of the tympanitic sound of pulmonary cavities the pitch is sometimes high and sometimes low, according to the elasticity and tension of the walls, the diameter of the opening of communication, the volume of the cavity or the length of the air-vibrating columns.

Perhaps Dr. Flint arrives at his conclusion by simply comparing the sound of a tympanitic abdomen with the normal vesicular resonance; and Dr. Loomis may arrive at his by thinking with Skoda that the sole cause of tympanicity is relaxation and decrease of tension of the tissues.

Massachusetts Medical Society.

SHATTUCK PRIZE.

The Committee on Publications are authorized to offer a prize of one thousand dollars for an essay, worthy of a prize, on The Climate and its Modifications as Influencing Health and Disease, or on any of the Diseases of the Inhabitants of New England, or on any kindred subject. Essays, each with a sealed envelope containing the author's name, must be delivered to the Chairman of the Committee on Publications on or before March 1, 1888. The name of the successful competitor, if such there be, will be announced at the annual meeting of the Society in 1888.

Any clew by which its authorship is made known to the Committee will debar an essay from competition.

ARTICLE XVII.

THE ANNUAL DISCOURSE.

ANTISEPTIC SURGERY.

BY FRANKLIN K. PADDOCK, M.D.
OF PITTSFIELD.

DELIVERED JUNE 10, 1885.

ANTISEPTIC SURGERY.

MR. PRESIDENT AND FELLOWS
OF THE MASSACHUSETTS MEDICAL SOCIETY:

FROM the most remote period in the history of surgery there have been conflicting opinions among eminent surgeons regarding the proper method of treating wounds.

The attention which this subject has for centuries received is indicated by the numerous works that have been written from time to time explaining and describing the various views of many different surgeons.

None of the many plans of treatment recommended proved sufficiently successful in results when thoroughly tested to deserve permanent adoption by the profession.

All concurred in the opinion that the subject was of great importance in the art of surgery, although a satisfactory form of treatment had not been discovered.

There appears to have been no general recognition of the natural tendency of wounds to heal until within a recent period. If this tendency was observed its importance was unappreciated and ignored by the profession, who, too often, by treatment, unwittingly retarded a process more essential than any method that could be devised.

I will not trespass upon your patience by asking you to listen to an account of the various treatments which, at different epochs in the history of surgery, have been in vogue, although the subject is far from being devoid of interest and fully demonstrates the natural ability of wounds to heal, even under conditions that would seem to render such a result impossible.

A review of the subject, however, as revealed in the history of wound treatment during the last twenty years, exhibits a greater degree of unanimity of opinion and practice among surgeons than previously existed during a similar period.

Within the two last decades the antiseptic treatment has proved far superior to other methods. Its importance is so generally recognized by the profession at large that it has received, by common consent, the distinctive title of "antiseptic surgery." The principles, merits, and methods of this treatment are more or less elaborately considered in all the recent works on surgery, besides which there are several volumes, each by a different author, devoted entirely to the discussion of the whole subject, including a description of its details and results. The study of its theoretical

and practical application is required in the curriculum of all medical colleges of the present day. Since the introduction of the antiseptic treatment there has been signal increase in the success of surgical operations. Many wounds, which formerly were considered almost necessarily fatal, with this method of treatment heal kindly and rapidly. In consequence of this fact a large number of operations are rendered feasible and practicable that were previously undertaken by surgeons only as a last, if not hopeless, resort. The present high attainment of the surgical art owes so much of its success to the virtues of the antiseptic treatment that its importance should be indelibly impressed upon the mind of every medical man.

There is a certain class in our profession consisting of a very respectable minority who are prone to cling to old ways and customs, and who are disinclined to leave the well-beaten paths that time and long experience have furrowed, although the course may be rugged and difficult and embellished with numerous evidences of unsuccessful results. This worthy class of medical men, forming, as they do, the important rear-guard of our profession, are slow to adopt new theories and modern practices. The merits of this method of treatment, however, are so great, perhaps I am justified in saying, so exclusively applicable in preference to other forms, that the time has arrived when this Society should exert a decided influence to establish it upon the firm foundation of public opinion. It is certainly far superior to any kind

of wound treatment previously practised, and its value has been sufficiently attested to demand, not only a general recognition, but also universal adoption, by the profession.

The impression which seems to prevail in certain medical circles that this method is adopted by the entire medical fraternity is incorrect; it is included mainly in the practice of the more prominent surgeons residing in the larger communities of this Commonwealth. But there are a large number of practitioners who are occupied a greater portion of their time in the practice of medicine and are occasionally called upon to fulfil the duties of a surgeon. Many such, either for want of familiarity with principles involved in the antiseptic treatment, or because of a lack of knowledge of the details of the process of applying the dressings, fail to employ this method in their operations or in their management of accidental wounds. So far as I have observed, a similar condition prevails throughout the country.

In Germany the employment of the antiseptic treatment is demanded by public opinion.

A short time since a German surgeon performed an ordinary operation without using modern precautions, and the patient died of septicæmia. Public opinion was sufficiently enlightened, discriminating, and energetic to demand that the operator be prosecuted for malpractice.

A similar sentiment is needed in this country to insure a more general adoption of the antiseptic treatment of wounds, a sentiment like the one

which exists regarding the value and the necessity of vaccination.

Were it not for the influence of public opinion, Jenner's wonderful discovery would render comparatively very little service to mankind. The public demand the protection afforded by vaccination. So strong and general is this sentiment that the statute renders its neglect an offence incurring the penalty of a fine.

Notwithstanding these facts, there are to-day medical men who, having enjoyed opportunities furnished by education and observation such as to render their opinions upon most subjects valuable, profess to believe that vaccination is injurious rather than beneficial, and, if their views should prevail, this valuable boon would be denied the public. The influence of such men would be extremely pernicious and prejudicial to the general health were it not that public opinion is established and their views are discredited.

The principle involved in antiseptic surgery is of as much importance as vaccination, and public opinion must, sooner or later, sustain it with equal vigor.

Although this treatment has been practised twenty years, with results that have earned for it a specific title, still its complete degree of usefulness is not yet attained. Undoubtedly there is a better antiseptic remedy than has yet been discovered. Those already in the service have produced surprising results, which have steadily improved as better methods of application have been gradually developed.

It is not my purpose to proclaim to you the discovery of a new antiseptic agent. Nor have I any original ideas regarding the treatment of wounds to parade before you. I aim simply to present briefly the theory of the antiseptic treatment and its great importance in surgery.

The discovery of the cause of putrefaction in wounds led to the development of this method. For years previous to this discovery contact with the air was known to cause, or, more correctly, to be followed by, decomposition of wound secretions. That the air was the cause of this tendency in open wounds to degeneration seemed to be proved by the well-known fact that subcutaneous wounds, exhibiting similar pathological and physiological conditions, healed, not only without putrefaction, but with little or no inclination to suppuration. Whether this effect was occasioned by the chemical or mechanical influence of the atmosphere was undecided.

This question, however, was finally settled completely by the experiments of Pasteur. These determined the cause of the decomposition of dead animal tissue, as well as that of wound secretions, to be a substance foreign to, but floating in, the air in the form of a microscopic dust. This invisible material is composed of innumerable germs and spores, termed bacteria and micrococci, whose proportions are so infinitesimal that their detection had eluded the observation of the most careful students of pathology.

Following the announcement of Pasteur's dis-

covery, experiments and investigations were made by Lister, Tyndall, Jeffries Wyman, and a host of others, which fully demonstrated the harmless influence of pure air upon wounds, and at the same time illustrate the character and functions of putrefactive germs.

The history of these investigations and experiments, revealing, as it does, the pernicious effect of these germs upon the healing process, forms a most interesting and important chapter in the literature of antiseptic surgery, and deserves something more than the brief allusion which I can allow this branch of the topic.

I should do my subject as well as myself an injustice if I failed to allude to the fact that there are still some surgeons who doubt that these germs are the cause of putrefaction. They account for their presence in decomposing animal substances as accidental, or, perhaps, as a consequence of finding a soil in which they thrive. They consider that these organisms feed upon, and help to dispose of, decomposing substances, although they admit that, secondarily, the germs produce a detrimental influence by their excessive development.

Every open wound that is not treated antiseptically exhibits in its secretions, when they are examined with the microscope, certain organisms. These are developed from germs deposited by the air coming in contact with the wound itself or its discharges. These microörganisms vary more or less in form and appearance. The question of

the identity of these different-shaped bodies is not yet definitely decided. That one form represents a more perfect development of the other is maintained by some, while the majority believe that they are distinct and separate structures. Their mode of increase is mainly by division. The rapidity of growth depends in a large degree upon the nature of the fluid in which they happen to be. When the conditions are the most favorable for their development they double their numbers once or twice every hour. Under certain circumstances the bacilli increase by the production of spores. The process of their development is almost identical with that of the yeast plant in the alcoholic fermentation. They find in the discharges from a wound every condition, the requisite warmth, moisture, and nutrient material, most favorable for their existence and growth. Planted in this favorable soil they thrive and multiply until every drop of the discharge in every part of the wound is invaded.

The healing process does not seem to be particularly interfered with by the mechanical irritation of these bodies. It is the result of their vital action in appropriating for their growth certain elements contained in the secretions. Decomposition of the organic compounds which constitute the substance of normal discharges naturally attends the functional activity of these organisms. Recombination of the elements thus set free results in the formation of material more or less septic in character and prejudicial to the process of healing.

A similar decomposition of organic compounds, followed by recombination of their elements into new and entirely different forms, characterizes all processes of fermentation. Putrefaction is, therefore, recognized as a kind of fermentation, which, by natural preference, thrives best in animal secretions and devitalized animal tissue.

The course pursued by an open wound during the process of healing is too familiar to need description. These organisms rapidly develop in its discharge. The tissues involved become more or less inflamed. The pus gradually loses its healthy, creamy character and exhibits a fetid odor. The normal secretions are replaced by a septic fluid which bathes its surface and which, to some extent, is absorbed, and impairs the health of the patient. Granulation and healing are rendered slow and tedious. The long-continued, profuse discharge exhausts the system, and the resulting cicatrix is unnecessarily large and unsightly.

The introduction of these germs into wounds that are closed while fresh, and coaptation of the parts secured, so as to prevent the accumulation of secretions, is not always, nor perhaps generally, followed by fermentation. The vigor of the healing process existing in the healthy tissues of two opposing surfaces brought into immediate contact is sufficient to destroy the vitality of these organisms.

It is the accumulated or exposed secretions and discharges that furnish conditions favorable for their development. And even these, if composed of normal serum and thick, healthy pus, appear to

be able to resist, to a considerable extent, the pernicious influence of the germs, affording them insufficient nourishment to sustain their vitality.

These facts show that, under very favorable circumstances, the presence of organisms in a wound does not necessitate the occurrence of putrefactive fermentation, even when no effort is made by specific treatment to prevent such a result. The ability of wounds to heal, practically without discharge, by the process of scabbing, is a further illustration of this point. Notwithstanding these undoubted evidences of the ability of certain wounds to heal readily without antiseptic treatment, still the tendency of the majority to become the seat of fermentation and decomposition is too frequently demonstrated in practice to question the necessity of some protection.

The demand for some form of treatment that would obviate the detrimental effect of the organisms was apparent soon after the announcement of their discovery. The recognition of this demand, together with the application of measures fulfilling its requirements, by Sir Joseph Lister, twenty years since, is the first legitimate accomplishment in the history of antiseptic surgery. Other surgeons were conscious of the necessity of protecting wounds from germinal influence. Lemaire even used carbolic acid, with fair results, but he evidently failed to grasp a principle, the announcement of which has made Sir Joseph Lister famous.

Since the discovery of the fact that putrefaction can be prevented by the exclusion of germs, it

has been determined that after fermentation has been established in a wound, the application of antiseptic agents, remedies which act as germicides, stops fermentation, destroys the organisms, and a normal condition of healing is resumed.

Therefore, in carrying out the principles of antiseptic surgery, one of two objects must be accomplished. Either living germs should be prevented from entering wounds, or accession being allowed they should be removed or destroyed before they have occasioned injury by their development. It is apparent that they can only be deterred from entering wounds that are made by the surgeon during an operation. To attain this it is necessary to saturate the air that is liable to contact with the exposed surface with antiseptic spray. For this purpose, a solution of carbolic acid is usually employed, of the strength of one part of the acid to twenty of water; this is applied with a steam atomizer.

The spray should be used before the first incision is made, and should continue without cessation until the operation is finished and the wound dressed. A thorough saturation of the atmosphere is aimed at without producing excessive moisture.

Every instrument used in the operation should be perfectly clean, and moistened in a solution of the agent. The hands of both the operator and his assistants should be scrupulously clean and frequently moistened by the same fluid. The sponges should be carefully selected, and, together with the ligatures, sutures, and everything that comes

in contact with the exposed surface, should be thoroughly disinfected in order to prevent the admission of vital particles possibly adherent to the articles used in the operation.

All bleeding vessels should be either ligated or their orifices occluded by torsion.

The wound should be well sponged, laved, or douched with a very mild solution of the antiseptic agent before closing it. When the surface is quite large, as is the case in an amputation of a limb or breast, a drainage-tube should be inserted to allow of the escape of any excess of secretions that otherwise might accumulate between the flaps. The latter should be brought into as perfect coaptation as possible by sutures that have been soaked in the germicide liquid.

The next step is the dressing of the wound. This is of no less importance than the other measures, and consists in still surrounding the parts with an antiseptic atmosphere. To secure this, loose, porous material is employed for the compresses and bandages, which are thoroughly infiltrated or saturated with the antiseptic agent. Gauze, surgical cotton, jute, oakum, or any other substance that will retain the vapor of the germicide, is suitable for protection, provided a sufficient quantity is used in covering and wrapping the parts to entirely absorb the discharge and prevent its coming in contact with the atmosphere at the surface of the dressing. In order to accomplish this, the dressings should extend considerably beyond the wound in every direction.

The drainage should especially be provided for by an abundance of absorbent material.

If, at any time during the healing process, the discharge should extend beyond the limit of the dressing, and exhibit indications of putrefaction, the question of re-dressing the wound would need to be considered without delay. If, however, the secretions are not in excess and the proper measures are carried out with the success that almost invariably attends this sort of treatment, the wound practically assumes the condition of a subcutaneous lesion, and, like it, tends to recovery without sufficient inflammation to produce suppuration.

The blood-clots, extravasated or effused between the flaps of such a wound, become disintegrated by the growth of cells extending from the tissues. These permeate the clots in every direction, and gradually they are absorbed in the same way that blood is disposed of, that is, extravasated subcutaneously. Wounds, the result of surgical operations, receiving this treatment, rarely require a second dressing in less than seven or eight days, when, as a rule, it will be found that union has taken place and the healing process well established. If catgut ligatures were used, then absorption is assured, while non-absorbent ligatures will occupy a small sinus, only of sufficient size to allow their easy removal when separated from their attachment. The disinfected sutures do not cause apparent irritation, although they are permitted to remain longer than is necessary to in-

duce union by first intention. The employment of a drainage-tube occasions little or no embarrassment to the rapid union of such wounds. Ordinarily they can be removed on the third day.

The dressings should be reapplied and maintained until the openings for the ligatures and drainage are perfectly closed.

The employment of drains composed of substances capable of absorption, like catgut and decalcified bone, simplifies the treatment, as the drains disappear at the end of a few days, when they have performed the duty expected of them.

Union by first intention is the result anticipated in most fresh wounds. This renders the first dressing of greater importance than subsequent ones, for, if the germs can be excluded and inflammation prevented during the first week, the healing is practically completed before the first is removed, and the succeeding treatment consists in the application of very simple dressings. If, however, it should become apparent from the general condition of the patient, the presence of fever, the existence of pain and tenderness locally, and the occurrence of a fetid discharge, that fermentation is established, then primary union should be despaired of and the second dressing applied without delay. The same fidelity should be observed in the application of the second dressing that characterized the first.

The interruption of the fermentative process which has become established in the wound should form an important feature of the subsequent treat-

ment, and test the value of antiseptic agents in destroying the putrefective organisms.

This leads to the consideration of the second method referred to, of antiseptic treatment. This is precisely the same in all its details as that already described, except that the spray is omitted, and no effort is made to destroy the germs in the air that come in contact with the wound during the operation.

The use of the spray is not absolutely necessary to secure antiseptic results, because of the ease and readiness with which the organisms can be devitalized and removed from the wound surface, after the completion of the operation but previous to the closure of the flaps.

This is accomplished by carefully and thoroughly sponging, laving, or douching with a solution of the reägent having sufficient strength to destroy the organisms without materially affecting the tissues.

In country practice, especially, the use of the spray, in many instances, is impracticable. A variety of circumstances combine to prevent its employment. Some of these are frequent absence of assistants, the isolation of the patient, and the difficulty of always having a proper atomizer in working order. It is therefore very fortunate that the spray is not essential, in the majority of cases, to the success of the method.

In the larger operations, however, like ovariotomy, its use is always advisable, because if it is not absolutely necessary, it certainly does no harm.

And every possible safeguard should be employed in operations of such magnitude.

In fulfilling the conditions of this method, the simple application of germicides only partially completes the requirements of antiseptic surgery. There are other causes of inflammation than bacteria, which, it is apparent, must be avoided. The observance of every measure which hastens complete recovery is included in this system of treatment.

The general health of the patient is one of the most important considerations in determining the prognosis and the result of a wound. Freedom from mental and arterial excitement should be secured, as well as perfect rest and comfortable posture for the wounded part. These and many other considerations, varying, of course, to meet the demands of special cases, must not be ignored in fulfilling the requirements of this method.

In the case of accidental wounds, wounds that have been freely exposed to the air are more or less inflamed, and frequently the seat of fermentation when first seen by the surgeon. The same general principles must be observed as in the treatment of wounds made by the surgeon's knife.

The primary object is to destroy all the bacteria and micrococci that are present; this is accomplished by making a thorough application of the lotion to every portion of the wound. Syringing and douching are important measures in rendering the germicide efficacious. The secondary object to accomplish is, by efficient external dressings, to prevent the access of new germs.

Most accidental wounds are of recent occurrence when first placed under the surgeon's care. These, after being well cleansed and rendered aseptic, can be closed by sutures, with a fair prospect of securing union by first intention. The value of absorbent drains and efficient antiseptic covering is particularly marked in this class of wounds. Union by second intention is frequently acquired in such when primary union has failed. To succeed in this, careful coaptation of the granulating surfaces must be made and complete protection from subsequent germinal invasion assured.

It is surprising how rapidly even large wounds of this sort usually heal when treated in this way. Wounds that require weeks of treatment by ordinary methods get well in as many days when fermentation is prevented. The effect of germ exclusion is to immediately diminish the amount of the discharge, and at the same time radically change its character; the pus becomes normal, and the necessity for frequent dressings is obviated.

The importance of furnishing an abundance of porous antiseptic material to envelop the wounded part, for the purpose of filtering the air and absorbing all discharge, should not be forgotten, for the efficiency of the treatment depends upon complete protection.

The antiseptic treatment of abscesses, both acute and chronic, involves the execution of the same general details. Their contents should be evacuated in such a way as to prevent the access of air or germs to the abscess cavity. Thorough drainage

should be established, employing, if necessary, rubber tubing, spun glass, or horsehair. The entrance or orifice should be well protected from infection by the antiseptic gauze or other equally efficient dressing. The results of similar treatment in the management of pleural and psoas abscesses show a decrease of fatality as compared with other methods.

The injection of abscess cavities is rarely necessary; in fact, the danger of the absorption of the antiseptic is so great, especially in large cavities, that it should generally be avoided.

The important part of the local treatment consists in preventing the access of germs to the cavity. It is quite evident that the discharges of suppurating wounds, as well as the pus of abscesses, constituting, as these substances do, such favorable conditions for the development of putrefactive germs, should be made to flow away as rapidly as possible. To facilitate the speedy removal of such, constant irrigation is often of great service, using some antiseptic solution for the irrigating fluid. In case of wounds or abscesses that furnish discharges so profuse that absorbent dressings fail to afford sufficient protection, this treatment proves very serviceable in excluding organisms. It also tends to prevent any accumulation for the germs to develop in.

The antiseptic water-bath, for treating wounds of the extremities, is a method employed by some foreign surgeons with excellent results. The injured limbs are immersed in water which has

been impregnated with alcohol, tincture of benzoin, or some agent to prevent fermentation. The contact of the water relieves inflammation and favors rapid granulation. There is a class of wounds which, I should judge, would do very well with the water-bath treatment. I am not aware, however, that it is employed to any extent in this country.

The recognition of bacteria as the cause of putrefactive fermentation logically led to the search for, and the discovery of, agents inimical to septic organisms. There are many substances that will destroy these microscopic bodies, but only a few are applicable in the treatment of wounds, in consequence of their injurious effect upon animal tissue. The term antiseptics, in its restricted sense, therefore, only includes those agents which can be employed to check germ development without producing serious detrimental effect upon wounds. The specific virtues of the different remedies are somewhat varied. They all tend, however, toward the accomplishment of the same object when properly and intelligently employed. Some of them are vigorous germicides, and destroy rapidly both bacteria and micrococci. Others exert a fatal influence upon bacteria, leaving the spore and micrococci unaffected, to develop in their natural way. There are still others that render the different varieties of germs inactive and inert without devitalizing them. As soon, however, as the effect of the agent ceases, they resume their active reproduction and pernicious influence.

The artificial cultivation of these organisms has been successfully accomplished by numerous investigators, and their behavior under the influence of the various antiseptics carefully observed, so that the knowledge we possess of the protective properties of these remedies is the result of scientific research as well as the effect of experiments upon wounds.

The antiseptic which, from the inauguration of this treatment until of late, has been inseparably connected with the method, is carbolic acid. The fact that it was first successfully employed in demonstrating the principles of the antiseptic system will always contribute to its notoriety, even if its virtues are excelled by some other agent. However, notwithstanding its defects, carbolic acid has not yet been displaced, although it does not at present maintain its former exclusive position in antiseptic surgery. The chief advantage is its universal applicability to all wounds as a germ destroyer, as well as its adaptability as a purificator to the hands and all materials used in an operation and about a denuded surface. Its disadvantages are, that it occasionally absorbs and produces poisoning; that when employed of sufficient strength to act vigorously as a germicide it excites local irritation in and about the wound; that its volatility renders necessary a more frequent change of dressings than is desirable. These objectionable qualities are magnified and exaggerated by the lack of skill and tact in its application. To avoid its toxic effects, the continued application of the

acid to an extensive granulating surface should be interrupted, and the strength of the solution used carefully regulated.

Some constitutions are very sensitive to its influence, owing either to individual idiosyncrasy or to the existence of renal disease. Such are apt to feel the toxic effect of the drug, even when sparingly applied to a raw surface. Nevertheless, when the fact of its general employment during the last twenty years is considered, it is astonishing that comparatively so few cases of poisoning have been reported as a result of its antiseptic use.

Scarcely less can be said of the importance of corrosive sublimate as an antiseptic than of carbolic acid. It is certainly a more effective germicide. A very weak solution, one part to a thousand of water, immediately destroys both bacteria and micrococci, while a still milder solution, one part to five thousand, paralyzes, without devitalizing, them. Its application to the surface of wounds causes less irritation than carbolic acid. Its disadvantages are that it occasionally produces fatal poisoning by absorption; that the constant wetting of the skin in the vicinity of the wound not infrequently developes a troublesome eruption; that it tends to chemically combine the albumen in the discharge, forming a compound that is practically inert as an antiseptic; that its corrosive action upon metals unfits it for the purpose of disinfecting surgical instruments.

Another very active germicide is the chloride of zinc, used in solution in water, in the proportion

of from two to eight per cent. This agent is not applicable in the treatment of recent wounds, in which union by first intention is expected, because of its caustic effect upon the tissues. It is, however, exceedingly effective in destroying organisms in suppurating wounds, especially where septic material is abundant.

There is also a chemical action exerted by the agent upon the discharges, resulting in the formation of a film of zinc albuminate which covers the surface of the wound and constitutes an efficient protection so long as it remains. Zinc is not absorbed and its use is not attended with the danger of poisoning, although when the solution is too strong it may induce local inflammation and sloughing. It is not adapted for use as an external dressing; other agents are more efficient for this purpose.

There is one other antiseptic that I will speak of somewhat in detail, and that is iodoform. This has proved very effective as an external application in preventing the access of germs to suppurating surfaces. When applied too freely there is danger of absorption and iodoform poisoning. It is therefore kept from too intimate contact with the wound surface by using gauze or similar porous material as a medium of conveyance.

The dressing is prepared by rubbing or pressing finely pulverized iodoform into the meshes of any thin, loosely woven fabric like cheesecloth. The powder not admitted into the interstices of the mesh and there retained should be removed by

gently shaking the cloth until the excess of the agent is disposed of. The resulting iodoform gauze constitutes not only a safe but one of the most valuable dressings for the protection of all kinds of wounds from infection. The gauze should be applied in layers to a sufficient depth and extent to absorb the entire discharge. It is a dry dressing and does not favor decomposition as the moist variety do.

The iodoform adheres to the gauze with sufficient tenacity to prevent enough of it from coming in contact with the absorbing surface to induce poisoning. Wounds that have been thoroughly cleansed and rendered aseptic by other agents can be maintained in a healthy condition with the protection afforded by this gauze for a considerable period.

The healing process in many instances is completed with one dressing, even when the wound is ragged, contused, and inflamed.

The progressive development of the principles involved in antiseptic surgery reveals the virtues as well as the deficiencies of the various antiseptic remedies. The search for one that is perfect is as yet unrewarded, although its vigorous prosecution has brought to the notice of the profession quite an array of drugs possessing in a greater or less degree antiseptic properties.

The comparative merits of these different agents are gradually being demonstrated by many surgeons. Every year adds much to our knowledge of their general usefulness, and their individual

fitness for wounds and special purposes. Permanganate of potassa, iodine, bromine, salicylic acid, acetate of alumina, naphthalin, subnitrate of bismuth, and the oil of eucalyptus are some of the more prominent agents receiving attention at present.

In selecting and applying these remedies there are several rather important considerations to be borne in mind. Their indiscriminate and unintelligent employment, without reference to individual adaptation and effect, is apt to disappoint the expectation of the surgeon by results that are either negative or injurious.

(1) The nature and requirements of the lesion must be considered. Fresh, clean wounds require simply protection from the causes of inflammation. The chief of these is obviated by excluding the putrefactive germ with the external antiseptic dressing. Whereas suppurating wounds, in addition to, and premising protection, require the extermination of the bodies that have gained admission to, and are multiplying in, the discharge. In accomplishing these different objects not unfrequently more than one remedy can be used with benefit in the treatment of the same lesion.

(2) The efficiency of the agent employed as a germicide should be considered. As a rule, the degree of putrefaction present determines the required strength or vigor of the antidote.

(3) The local effect of the agent upon the surface of the wound should be anticipated.

(4) The toxic influence of the drug, resulting

from its possible absorption, should always be kept in view.

The majority of the germicides now in use produce injurious effects when introduced into the circulation in immoderate quantity. The danger of absorption depends in a measure upon the extent of surface exposed, as well as upon the length of the period of contact.

As the principles of the antiseptic method have become more distinctly defined, the more fully is the fact recognized that the natural secretions form the most suitable fluid for bathing healing surfaces. When this is normal in character and amount, the employment of antiseptic or other lotions to dilute or replace it, is an uncalled-for and injurious interference with nature. The aim and object of this method is to protect the normal secretions from the organisms which render them abnormal. The faithful and intelligent application of external protective dressings secures all the advantages that are to be derived from the use of antiseptic agents in the care of many wounds. Many of the cases of poisoning that have been reported can undoubtedly be reasonably attributed to their unadvised and too generous employment.

Some form of protection may be developed in the future which will enable us to dispense with drugs. At present, however, there is little or no light in this direction. In order to appreciate the great changes, and the wonderful improvements in surgery since the introduction of the antiseptic treatment, it is necessary to take a retrospective

view of the results obtained previous to the last twenty years. That this improvement and progress in the surgical art is attributable to the discovery of the putrefactive germ, and the consequent development of the principles and methods comprised in the antiseptic treatment, no fair-minded person familiar with the facts can for a moment doubt.

Formerly the danger of gangrene, septicæmia, pyæmia, and erysipelas following operations and accidental wounds was appalling, and the operator was constantly oppressed with the nightmare of apprehension. The unfortunate complications attending suppuration and the process of healing by granulation induced surgeons to avail themselves of very radical measures to secure healing by first intention. Many limbs were sacrificed by amputation in order to avoid the risks associated with the healing of inconsiderable wounds by granulation. Even this extreme course of treatment too frequently failed in securing immunity from the evils connected with suppuration.

The surgery of twenty years ago was so different from the surgery of to-day that a comparison between the two is unsatisfactory, being rendered so by the great variety of operations that are now practicable which then were rarely undertaken.

The contrast in treatment and results is equally great. Formerly the mortality following major operations was about thirty per cent., the greater number of the fatal cases being the result of pyæmia or septicæmia. The present mortality after

such operations is reduced to about five per cent., and septic poisoning is a rare occurrence, except in cases that are not properly protected by the antiseptic method.

Conservative surgery has progressed surprisingly since the elimination of septic poisoning from the list of probable dangers attending the healing of open wounds. The success of conservatism has naturally resulted in narrowing the field of heroic surgery, which is employed now with more caution than formerly. A comparison of the results of similar operations, as formerly conducted and as now treated with antiseptic protection, reveals in a marked degree the advantages of the new method. A list of five hundred and sixty-three amputations, reported by Malgaigne in 1842, including amputations of the thigh, leg, foot, shoulder-joint, humerus, and forearm, resulted in a mortality of three hundred, or over fifty-two per cent.

Paul, in 1854, gathered and reported a list of 5,060 amputations, including both upper and lower extremities, the mortality of which amounted to 1,997, or over thirty-nine per cent. These reports are fair illustrations of the results obtained with old methods of treatment.

Schede reports a list of 321 amputations, including both extremities, treated antiseptically, with a mortality of less than five per cent.

Volkman reports 139 similar amputations receiving also antiseptic treatment, with a mortality of less than four per cent.

I am conscious of the unreliability of such statistics as these in demonstrating accurately the respective merits of different methods of treatment. Still, the marked difference in results is so commendatory of the antiseptic method that a reasonable degree of error in compilation can be admitted without materially lessening the contrast between the two methods.

A very recent report of the results of over twelve hundred surgical wounds and accidents, treated antiseptically with corrosive sublimate, shows a mortality of only five per cent., and only one death could be attributed to the toxic effect of the antiseptic. More than three-fourths of these wounds, over nine hundred in number, united by first intention, while more than one half of the balance healed by second intention. The serious nature of many of these wounds is apparent when it is understood that of the whole number 91 were major amputations, 117 were resections of portions of the long bones, 91 were compound fractures, 69 were joint operations, 84 were operations for hernia, 3 for removal of the kidney, 25 for ovariotomy, and 8 for resections of the intestines.

Formerly the mortality of cases of compound fracture of the long bones averaged one in every four. The complicated nature of this double wound in every way favored the absorption of septic material. The long-continued suppuration reduced the vigor and vitality of the constitution, while at the same time it delayed indefinitely osseous union.

A remarkable change in the results of these

injuries has been occasioned by antispetic treatment. This consists in practically closing the external wound at once by the dressing. The danger of septicæmia is thus greatly diminished, suppuration is prevented, and the bone unites with the same facility and rapidity as in cases of simple fracture, while the mortality is reduced to about the same ratio as that following fractures uncomplicated with an external wound.

Some of the most brilliant achievements of modern surgery are the results of operations involving the exposure and exploration of the abdominal cavity. The protection afforded by the exclusion of germs has rendered these operations successful, although formerly they were so uniformly fatal that their performance was considered unjustified, except as a last resort.

Fifty per cent. of recoveries used to be thought a fair and reasonable expectation in operations of ovariotomy, the mortality being caused in a large majority of the cases by septicæmia or septic peritonitis. At the present time the death-rate of unselected cases is reduced to about ten per cent.

When every condition is favorable ovariotomy is almost invariably successful, provided modern rules and precautions are observed and a fair degree of skill is exercised. The astonishing success attained in this particular operation is unquestionably the result of a comprehension of the principles and faithful execution of the details involved in the antiseptic method.

Other operations, requiring exposure of the

abdominal cavity and its contents to the influence of the external air and the irritation of manipulation, have also proved surprisingly successful. In a corresponding degree have the results of most other surgical operations been favorably influenced by this method. Exsection of joints, exsection of portions of shafts of bone, opening into and exploring joint-cavities, amputation to check senile gangrene, besides many other operations which, in former times, were considered extremely doubtful as to results, are, at the present day, performed with an assurance of success not dreamed of thirty years ago.

In fact, there are few, if any, external wounds known to surgery that have not, at least in some degree, contributed to the vast and increasing fund of accumulated testimony which establishes the great importance of the principles embodied in antiseptic surgery. Allusion has been made to the importance of recognizing the fact that there is a limit to the beneficial application of antiseptic agents. Since this limit has become more distinctly defined and its value more fully appreciated, there has been increased success in wound treatment. It is also important to remember that the antiseptic agent employed is not necessarily the *sine qua non* of the method, but that success depends largely upon the faithful, intelligent, and persistent execution of the details required to prevent inflammation.

It is unnecessary to say more. Even now I have trespassed too far upon your good nature in stating facts that are an open book to the profession.

The subject is worthy of a more facile pen than I can wield, and should be presented by one who has more perfect knowledge than I possess, and a wider experience than I have enjoyed. The knowledge that I am addressing to-day some who are endowed with these accomplishments does not deter me from exerting my influence, however slight it may be, to induce every member of this Society to avail himself of the advantages connected with the practice of antiseptic surgery.

The fact that there are scores of physicians in this Commonwealth, members of this Society, who have never fully employed the antiseptic method in wound treatment, places me under an obligation as a medical brother to convince them, if possible, of its superior merits as compared with other practice.

To assert that antiseptics, especially carbolic acid, are not generally employed by my fellow country practitioners, would be most assuredly false. But they are not applied in a manner to secure the advantages entitled to the antiseptic method. In the form of lotions and washes they do exert, to a certain extent, a beneficial effect, but the protective dressing, upon which depends the question of putrefaction in most wounds, is practically omitted except by a minority of physicians. The application of lotions to fresh wounds is of very slight importance in comparison with the value of protective dressings to prevent the access of germs during the process of healing. However, to omit either the lotion or the dressing, except in special instances, is a violation of antiseptic rules. The best

results have been obtained by surgeons who have most carefully observed all the requirements and details of the treatment. Furthermore, in addition to strictly professional reasons for using this method, there is to be considered the claim of the patient. The members of the medical profession are not the real beneficiaries of the antiseptic treatment. Our patients have a right to enjoy the advantages and blessings conferred by antiseptic surgery, and it is our moral duty to afford them its benefits. The only apology entitled to acceptance that a member of this Society can offer a patient for neglecting to employ this treatment is a lack of familiarity with its principles and details. This, however, is so easily acquired at the present time that even such excuse should barely suffice to satisfy the expectation of the patient. If the presentation of this subject to-day results in stimulating my associates who are united with me in the rural practice of our noble profession to adopt more completely the principles and practice of antiseptic surgery, the present hour will not have been unprofitably employed.[1]

[1] The reader is referred to the works on antiseptic surgery by Cheyne, MacCormac, and Häcker, also a volume entitled "The Treatment of Wounds," by Pilcher, for verification of most of the statements made in the foregoing article.

ARTICLE XVIII.

THE INFLUENCE OF OVARIOTOMY ON SURGERY.

By JOHN HOMANS, M.D.
OF BOSTON.

READ JUNE 10, 1885.

THE INFLUENCE OF OVARIOTOMY ON SURGERY.

The privilege of addressing an assemblage of men engaged in the same pursuit, and having a sympathetic feeling for each other's endeavors to relieve suffering and lengthen human life, is one which I highly prize.

An audience furnished as this is from the annual meeting of the members of the Massachusetts Medical Society, is a sympathetic audience which it is a pleasure as well as an honor to address.

I shall not undertake to enumerate in detail all the operations which have followed the habitual performance of ovariotomy and the familiarity with the peritoneum that this implies. I will, however, later on enumerate many of them and narrate at length some of the most striking.

Many of the gentlemen present to-day will remember that not very long ago the distinction between surgery and medicine, or rather between a surgeon and a physician, was that the former dealt with maladies and diseases on the outside of the body, and the latter with those affecting the internal organs,—the principal exceptions to this rule being in the case of foreign bodies in the bladder or air passages. At the period referred to there were no special courses except on ophthalmology. Now the manner of teaching the science and practice of medicine and surgery has changed and developed so much, particularly during the last ten years, that one in search may find somewhere a special course on almost any subject connected with medical or surgical knowl-

edge. Among the branches of practical surgery, none has made greater strides, or been more fascinating in its performance, than abdominal surgery. Twenty-five or thirty years ago, the interior of the abdominal cavity, except to an occasional ovariotomist, or to a performer of Cæsarean section, was a *terra incognita*, and not only unknown, but feared and dreaded. The occasional, I had almost said every day, occurrence of stabs in the abdomen letting out the intestines and followed by recovery, taught surgeons nothing in regard to the harmlessness of simple incision of the peritoneum, and each case was treated with dread, and the rapid convalescence was recorded with wonder and reported as extraordinary. Still more severe injuries, caused by stakes or pitchforks penetrating the abdomen, only served to cause the instruments of these wounds to be preserved in museums, and the patients to be exhibited as surgical curiosities. No one saw and acted on the evident truth that a simple incised wound of the abdominal parietes was almost innocuous. This dread of the peritoneum was caused partly by the experience of surgeons in herniotomy delayed too long, or by seeing peritonitis and death follow a wound of the peritoneum made in a vaginal surgical operation; and by the experience of physicians in autopsies following septic peritonitis after childbirth, in which the intestines were found of a deep purple color and glued together by lymph and pus. All these experiences made the surgeon of twenty-five years ago fear to wound the peritoneum and held him back from opening it voluntarily and exploring its cavity. To look back now on the long list of recorded cases of men who were found in the streets with incised wounds of the abdomen, and whose intestines, covered with dirt, were carefully washed and replaced within the belly and kept there by sewing the wounded walls together, and who almost invariably recovered, makes us wonder that some one did not see that, if this class of wounds was followed by recovery, how much

more likely were wounds carefully made by a cleanly surgeon to unite and heal up!

The literature of abdominal surgery is to-day so voluminous that one man can scarcely read all that comes out in the periodicals alone. The operation of abdominal section, or opening the peritoneal cavity by an incision, has been called laparotomy, from the Greek word *lapara*, which means the soft parts of the body between the ribs and hips, and τομη, an incision.

Such words seem pedantic at first, but laparotomy is more concise than "abdominal incision," and we may as well use it. In the text books before 1850, ovariotomy is only alluded to, and laparotomy for the purpose of learning what the trouble was inside the belly, was not dreamed of. I never saw ovariotomy done in this city before I did it, and when I studied medicine here, it was not mentioned in lectures or in recitations on practical surgery, and its performance was discountenanced and discouraged by the highest surgical authorities in this neighborhood. Dr. Gilman Kimball, of Lowell, however, had been for many years practising ovariotomy in New England, and pursuing his work with great courage and enthusiasm. But by the profession generally the operation was not regarded favorably. Dr. Burnham, of Lowell, was also operating, and in other parts of the United States, Atlee of Pennsylvania and Peaslee of New York, were active ovariotomists. Spencer Wells, of London (now a Baronet, Sir Spencer Wells, on account of his triumphs in ovariotomy) had taken up the subject on his return from the Crimean War, where he had served as a surgeon, and between 1858 and 1864 had operated one hundred times with thirty-four deaths. Although this was a high mortality, yet Sir Spencer proved conclusively that the operation was not only justifiable but imperative.

To Mr. Charles Clay, of Manchester, England, credit is also due for reëstablishing the operation, but I think Sir

Spencer Wells's plan of showing all his specimens at Society meetings in London, and reporting every one of his cases, caused the revival and establishment of the operation.

I will not trace the history of ovariotomy, from its first performance by McDowell, of Kentucky, in December, 1809, to the present time; but will enumerate some of the operations and triumphs of abdominal surgery which have grown out of the familiarity with the peritoneum brought about by ovariotomy.

The first operation which followed the removal of ovarian tumors was the removal of fibroid tumors of the uterus. This operation is only to be done in exceptional instances, and its success will probably never equal that of ovariotomy, but the splendid results of Dr. Keith, of Edinburgh, thirty-five cures out of thirty-eight operations, show us what can be accomplished in the performance of this very formidable operation. When it was found that wounds of the intestine, made during an ovariotomy, often united when carefully sewn together, the natural inference was made that intentional wounds of the bowel could also be healed, and this inference was acted on and resection and suture of the intestine for the cure of fæcal fistula was successfully done.

Two cases of artificial anus have been cured by this operation by Dr. Porter at the Massachusetts General Hospital within the last eighteen months. It seems very hard, even now, to believe that the intestine can be pulled out of the abdominal cavity, pared, sewed together and returned, and the abdominal wound completely closed at once and a cure result. But I have myself seen it three times, and seeing is believing. Who does not remember some dreadful sufferer with an intestinal fistula following a strangulated hernia, dragging on a miserable existence, avoiding and avoided, without control over his offensive fæcal emanations, solid, liquid or gaseous. Now to-day ovariotomy has made possible an operation by which this sufferer can be made completely well again.

Laparotomy is done for operations likely to be successful, often or seldom, for cases almost sure to recover, and in desperate cases as a last resort, a forlorn hope. By means of it the spleen has been removed, cancers of the stomach and intestines have been cut out, gall stones have been removed from the gall-bladder, foreign bodies from the stomach and bowels, calculi from the kidneys, and even cancerous and diseased kidneys have been excised. The pain and discomfort from floating kidneys has been relieved by sewing the kidney to the abdominal parietes and fixing it in place. All of these operations have been successful in numbers of instances. Perhaps one of the most remarkable instances of successful abdominal surgery is the recent case of Dr. Bull, of New York, who opened the abdomen in a case of pistol shot wound, found seven perforations of the bowel, sewed the holes together and cured the patient completely. I saw Mr. Thornton last summer, in London, lay open the stomach and remove a mass of hair shaped like a sausage and nine inches long by two thick. After the removal of this mass, the wound in the stomach was very carefully and patiently sewed together, and the woman did not even vomit during her convalescence, which was uninterrupted. It may be interesting to say that the mass of hair was the accumulation of nearly twelve years, during which the woman had swallowed what she combed out each night and morning. Mr. Tait, of Birmingham, has shown that great suffering is caused by pus in the Fallopian tubes, and has cured many cases by removal of the tubes. You would be surprised to see how large these tubes, distended with pus, sometimes become. I have seen them of the size of a cow's horn, twisted and convoluted. Removal of the ovaries for hysteria, for insanity, and for the cure of painful menstruation (Battey's operation) has also been done. The sphere of this last operation should be closely and carefully limited, but in certain cases it is a pro-

per proceeding. Removal of the uterine appendages, to bring about atrophy of uterine growths, is very legitimate and promises well. Laparotomy has been done successfully and unsuccesfully in cases of intestinal obstruction. As the diagnosis of the causes of obstruction becomes more precise, so will its relief by surgery be more certain. Up to the present time the failures, I think, outnumber the successes. Laparotomy is also properly done to ascertain the character of growths within the abdomen when we are ignorant of their nature and uncertain whether we can remove them.

Simple laparotomy, properly done in a healthy subject, has no mortality, or perhaps a very small percentage, and is practically innocuous. *All of these advances in abdominal surgery, all of these triumphs and discoveries in an unknown region of the body, have been caused, brought about and made possible by ovariotomy.*

Encouraged by the success of operations in the abdominal cavity, the thorax is beginning to be explored, and the practice of surgery will probably be extended in this direction. I might give an account of the rise and progress of ovariotomy, and lengthen the list of abdominal operations which have followed it, and keep your interest and attention for many hours; but I have only tried to give a sketch of the influence of ovariotomy on modern surgery. A list of all the operations born of ovariotomy, which have been done successfully, would be long and tedious, but I will venture to enumerate a few. Enucleation, per vaginam, of the entire uterus for cancer of the body of the organ. (This procedure is still on trial, but in practised hands its reputation will improve.) Removal of the spleen for cystic disease; removal of the gall-bladder; cutting into the gall-bladder (choleccystotomy); hepatotomy (or incision of the liver) for abscess and for hydatids; nephrectomy (or cutting out the kidney) for calculous pyelitis, for cancer or for tubercle; nephrotomy (cutting into the kidney) for

abscess, or for purposes of exploration. Radical operation for the cure of hernia, by sewing together the pillars of the ring and the sides of the sac. Laparotomy has also been successfully done for pelvic abscess, for splenic abscess, for acute and chronic peritonitis, for hydatids of the peritoneum, for extra-uterine fœtation. Supra-vaginal hysterectomy in pregnancy with contracted pelvis (Porro's operation) has been often successful as a substitute for Cæsarean section; hysterectomy for the cure of uterine tumors I have already alluded to. That the abdomen could be opened, and an aneurism of an abdominal artery could be successfully treated, would not have entered into the wildest dreams of the most enthusiastic surgeon a score of years ago, and yet this has been accomplished lately by Professor Loreta, of Bologna. He opened the abdomen and found an aneurism of the superior mesenteric artery; he tried to tie the artery above the aneurismal sac, but found this impossible on account of the adhesions of the sac to the neighboring viscera; by puncturing the sac with a small needle and introducing two yards of fine copper wire he succeeded in producing coagulation and curing the aneurism.

My own operations now number two hundred and seventy laparotomies, of which two hundred are ovariotomies for the removal of cystic ovaries; several are cases of removal of ovaries and tubes for the cure of threatened or actual insanity; a very remarkable case of removal of a fibroid tumor of the abdominal parietes and peritoneum, and other laparotomies in which the abdomen was opened for various reasons.

I may be pardoned for narrating at length another very remarkable instance of the curative influence of an abdominal incision. It is a case of tubercular peritonitis. A single girl, twenty-one years old, feeble, pale and emaciated, with a large belly full of fluid, came to St. Margaret's Home a year ago. It was supposed that she had an ovarian cyst. After she was etherized I saw that the fluid was probably

ascitic; but I made an antiseptic (spray) exploratory incision to find out the cause of the dropsy. Much ascitic fluid ran out, and many flakes, masses, and layers of lymph. Tubercular deposits were seen scattered over the peritoneum and bowels. In short, the disease was tubercular peritonitis, as was shown from the gross appearances, and from the microscopic[1] examination of masses of the peritoneum which I cut away. In about two weeks the wound opened spontaneously to allow the ascitic fluid, which had accumulated, to run out. The girl went home at the end of three weeks, and returned to the care of Dr. Tower, of South Weymouth. At the end of four months she had gained considerable flesh, and had a good appetite; occasionally she walked out when the weather was pleasant. All this time the opening in the scar of the abdominal incision had been discharging serum. In February of this year, the catamenia, which had been absent more than a year, reappeared, and have returned regularly since. I learn from Dr. Tower that the wound is now healed, that the general health has improved wonderfully, that she is fat and of good color, and is contemplating matrimony. This is, so far as I know, a unique case, and its treatment and cure are direct outgrowths from ovariotomy.

I have given but a brief sketch of what ovariotomy has led up to, of the successes and triumphs which the establishment of the harmlessness of opening the peritoneum has achieved, and I have shown that all these successful operations within the abdominal cavity owe their inception and execution to the knowledge gained by the ovariotomist and furnished by him to the profession.

"We should count time by heart throbs, not by figures on a dial." We should weigh the results and influences of our work, and not simply count and enumerate our operations.

[1] The bacillus of tubercle was not found, however.

I care but little for a man's statistics unless I know the character of his work. One may cure all his cases, another may have a mortality of twenty per cent. The former may have an exceptionally favorable series of cases. You cannot judge which has really done the most good, simply by the reported statistics.

But these remarks are foreign to the subject of my address ; I only mean to say that on this day, the Anniversary of our Society, it would be well for us to weigh our deeds and see what we have accomplished in our lives, and I am sure we should find that we have made immense advances in the treatment of morbid states of the organs within the abdominal cavity; and I think you will all agree with me that to the establishment of ovariotomy we owe all our progress in this direction.

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ARTICLE XIX.

TEN CASES OF PREGNANCY AND LABOR, COMPLICATED WITH FIBROIDS.

By JAMES R. CHADWICK, M.D.
OF BOSTON.

READ JUNE 9, 1885.

CASES OF PREGNANCY AND LABOR, COMPLICATED WITH FIBROIDS.

Case. I.[1]—*Labor complicated with Uterine Fibroids and Placenta Prævia.*

May 12, 1875. Mrs. M., aged 42, had menstruated but twice in the past six months, the last time only two weeks before. Her abdomen had been slowly enlarging for six years owing to a fibroid tumor; the growth had been more marked during the last few months. A large hard mass lay on the right side, rising nearly to the liver; a small very hard tumor formed a distinct protuberance just above the navel; the epigastric region was occupied by a solid body connected with the main tumor, but only reached on deep pressure. Per vaginam the cervix was felt to be soft, the roof of the vagina less yielding than usual; no distinct tumor could be felt. On May 17th, a more thorough examination disclosed flatness over the greater part of the left side of the abdomen, although nothing could be felt except some small nodules.

These, however, were not immediately in contact with the abdominal walls, but were only reached by deep pressure in the direction of the pelvic cavity. Fluid alone could interpose between the abdominal walls and the nodules, and produce flatness, yet at the same time be so readily displaced as not to be perceptible to the touch. Ascitic fluid was soon excluded from consideration by the immobility of

[1] The reports of this and the next case are condensed from the Trans. Am. Gynæc. Soc., Vol. 2, pp. 255-267, 1877.

the flat area on change of the patient's posture. A fibrocyst seemed very unlikely from the relations of the tumors; pregnancy flashed into my mind as the only condition that would explain the phenomenon satisfactorily, and this suspicion the stethoscope confirmed by the discovery of the fœtal heart-sounds two inches below the umbilicus. It is needless to add that the nodules in the left side were the feet.

The peculiar doughy resistance around the cervix, the impossibility of bringing any part of the child within reach of the fingers in the vagina, together with the history of a hæmorrhage within two weeks, caused me to suspect the presence of a placenta prævia as a further complication.

Mrs. M. passed to the full term of pregnancy without other untoward events than several smart hæmorrhages, requiring only repose in bed for their arrest.

On August 13th the uterus began to contract feebly, but with some regularity. Hæmorrhage set in, and soon assumed alarming proportions; it was checked by plugging the vagina with a Barnes's dilator.

Examination twenty-four hours subsequently revealed the fact that, despite the regular recurrence of the pains in the interim, the os barely admitted one finger. The pains had not increased in severity or assumed at all the force of true labor-pains; yet the woman was beginning to show signs of exhaustion owing to them, and to the steady oozing of blood.

After consultation with Drs. A. D. Sinclair and E. G. Cutler, of Boston, ether was administered, and the cervix gradually dilated by digital pressure and manipulation. The placenta was prævia, but luckily only its border covered the os; this segment was readily peeled off and brought down into the cervix. The hæmorrhage was but slight, and soon ceased.

The placenta was now found to have its seat immediately over a large fibroid in the posterior uterine wall, that de-

scended to the internal os, and proved a serious obstacle to the insertion of the hand. This was, however, at last effected, the feet seized and dragged down. The greatest traction that I dared apply only brought the knees to the vulva. With the exercise of great care, yet of considerable force, I insinuated a hand along the curve of the sacrum, between the abdomen of the child and the fibroid tumor; with great difficulty grasped one arm after the other, and brought them into the vagina, fracturing the right clavicle during the process. By continuous forcible traction the shoulders were finally delivered, though the head evidently remained above the brim of the pelvis.

Again and again I tugged upon the body while Dr. Sinclair pressed the head down from above the pubes. At length it descended suddenly into the pelvis and was at once delivered. The child, weighing ten pounds, lived.

The placenta not coming away and there being no expulsive efforts of the uterus, the former was removed in a somewhat torn condition by the hand. In order to make sure that no portion had been left, I introduced my hand into the vagina, and to my dismay felt it pass into the peritoneal cavity outside of the uterus. Above the fundus of the uterus could be felt the intestines, but they showed no tendency to descend into the pelvis. A careful examination of the rent by Dr. Sinclair and myself, made evident that it was a transverse tear of the vagina, three or more inches in length, situated just below the insertion of the vagina into the posterior lip of the womb. Just above this lip, it must be remembered, was the large fibroid which had obstructed delivery.

Had I had my way at this point, I should have then and there extirpated that uterus by abdominal section, and the operation now known as Porro's would have been Chadwick's operation; but I was restrained by the counsels of Drs. Sinclair and Cutler, which I still recognize as wise from the standpoint of the experience of that day.

There seemed to be no hæmorrhage, so the ether was removed, the woman turned upon her back, and a tight bandage applied, by which means it was hoped that the edges of the wound would be kept in apposition, owing to the pressure of the uterus.

It is useless to give the subsequent history in detail. The first day was passed in perfect comfort; on the second, symptoms of peritonitis began to appear. On the third day the abdominal distention was so great as to require puncture of the intestines to allow the escape of flatus. Through the same trocar I essayed the injection of nutrient and stimulant fluids into the intestinal canal. The feasibility and objects of this procedure were fully set forth in a paper which I read before the New York Obstetrical Society on November 2d, 1875.[1] On the fourth day septicæmia and delirium set in, terminating fatally on the fifth day.

No autopsy could be obtained.

Several points in this case seem to merit consideration.

I will not dwell upon the very misleading character of the history as elucidated at the first visit, but I wish to emphasize the importance of having perfect accordance between the signs obtained by the different methods of examination, —in this instance, by palpation and percussion. By a neglect to recognize the discrepancy between the testimony derived from these two sources, I failed to make a correct diagnosis at my first examination, though I repaired the omission at the second visit. This point is furthur illustrated by

CASE II.—*Pregnancy complicated with one Fibroid Tumor.*

1876. Mrs. F. M., 33 years of age, had been married fifteen years without having had children or miscarriages. Menstruation had always been regular until seven months previously; since then it had not been seen.

[1] *American Journal of Obstetrics*, vol. viii. No. 3, Nov. 1875.

Five months before, she had consulted one of the most eminent and trustworthy physicians of Boston, whose notes describe the cervix as "hard, red, and granular," almost exciting a fear of commencing cancer. Nothing else abnormal was recognized.

Three months later he records another examination as follows: "cervix soft, os patulous; several large distinct tumors in the abdomen, forming a mass four or five inches in diameter, and lying between the umbilicus and pubes; one tumor was more prominent than the others. Other indistinct tumors in right iliac region. *Dullness on percussion extends beyond the distinct tumors.*" An unfavorable prognosis was given, which was concurred in a month later by one of our most prominent ovariotomists. She had not been examined since that time until, chancing to be making a professional visit in Holbrook, Mass., I was requested to see her in consultation with Dr. Kingsbury of that town. It required no great acumen on our part to recognize at that advanced stage, the existence of pregnancy at about the end of the seventh month, complicated by a fibroid tumor larger than a man's fist, in the anterior uterine wall.

The patient was delivered safely by Dr. Kingsbury two months after; at the end of another two months I was unable to find any trace of the fibroid.

I believe that the suggestion conveyed in the phrase which I have italicized would, if followed up, have given a clue to the true condition, although it was too early to hope for decisive signs at that time.

Another diagnostic point of the utmost significance is the sudden, rapid increase in size of a fibroid tumor which has been stationary for some time, especially if this coincides with absence of menstruation. This was the chief factor in the diagnosis of the following case, the notes of which have been kindly sent me by Dr. G. J. Townsend, of Natick, with whom I saw the patient in consultation.

Case III.—*Pedunculate Fibroid complicating Pregnancy and Labor. Delivery by Forceps. Speedy Absorption of the Tumor.*

Mrs. J. P. S., of Natick, aged thirty-eight years, four years married, primipara, menstruated last in February, 1882. In April she noticed a lump in the left iliac region, which, after some over-exertion, became painful and tender to the touch. In the latter part of May, Dr. Townsend was called in, and found an irregular nodular mass in the left iliac region, rising nearly to the crest of the ileum; the body of the uterus could not be felt. Pregnancy was suspected. I saw her on June 5th, and could recognize nothing definite but a fibroid tumor crowding the body of the womb, which was soft and indistinct, to the right side. The development of the tumor had, however, been far too rapid to accord with the clinical history of such growths. From this fact and the absence of menstruation, I had no hesitation in endorsing the previously expressed opinion that she was pregnant, and to give the assurance that no special danger was to be apprehended at the time of labor, owing to the fact that the tumor was manifestly subperitoneal and attached to the fundus of the uterus. The tumor increased greatly in volume as the pregnancy advanced, finally reaching as high as the margin of the ribs on the left side, and pushing the body of the womb to the right side. A pedicle running to the left horn could then be made out by Dr. Townsend. She experienced no inconvenience during pregnancy, except from undue distension of the abdomen. The labor, at full term, was tedious, owing to uterine inertia, finally necessitating a resort to forceps by Dr. Townsend. Convalescence was normal, except for an attack of cystitis. Involution was perfect, and no trace of the tumor could be detected three weeks after delivery. The patient is now (Feb. 17, 1885) in perfect health.

Brief notes of another case which occurred in his practice have been sent me by Dr. Townsend.

CASE IV.—*Multiple Fibroids complicating Labor.*

Mrs. J. S., aged forty years, primipara, was found by Dr. Townsend to have multiple subperitoneal fibroids in the fundus uteri when he was called to attend her in labor. Delivery was effected easily without interference. Involution was normal, and the fibroids had entirely disappeared two weeks after delivery. She is still living, at the age of seventy years.

This freedom from interference by the tumors with the normal course of pregnancy and labor I have learned to regard as the rule when the tumor has its seat in the body of the womb, so that it rises with the fundus out of the pelvis and thus presents no obstacle to the delivery of the child. I have had several such cases, of which the notes are now lost—or rather buried in the records of my Dispensary. One private case I can quote.

CASE V.—*Fibroids complicating Pregnancy and Labor. Normal Delivery. Subsequent Disappearance of the Tumor.*

Mrs. G. W. M., of Newton, aged thirty-six years, who had had six children and two miscarriages, was sent to me on April 17, 1878, by the late Dr. Allston W. Whitney, of West Newton. Since the birth of the last child, three years before, there had been some enlargement of the right side of the abdomen. She had not menstruated for six months. The vulva was found to be enormously distended by varicose veins. The abdomen contained a tumor, rising from the pelvis to an inch above the navel. Its general outline was symmetrical, but just above the navel projected a hard rounded mass as large as a fist, and a second small hard nodule below the other, and further to the right still a third. The rest of the tumor is soft and manifestly the pregnant uterus, within which the fœtal parts can be distinguished. The hard projecting masses are plainly fibroids. The woman was delivered without mishap on August 1st.

On October 28th she visited me again, as the abdomen had remained greatly distended ever since the labor, and she feared that the tumors had not been absorbed in child-bed, as I had assured her would be the case. On examination I found that the distension was entirely due to relaxation of the abdominal walls and to flatulence. The uterus was in every respect normal. There was no trace of the fibroids.

In the later months of pregnancy the difference in density of a fibroid and the pregnant uterus is generally so marked as to make the diagnosis simple; the same cannot be said of a fibro-cyst. Such I now conjecture to have been the tumor in the following patient whom I did not see when pregnant.

CASE VI.—*Cystic Tumor, diagnosticated as Ovarian. Subsequent Pregnancy and disappearance of Tumor after Labor.*

Mrs. E. P. M., of Malden, was sent to me by Dr. Alonzo Towle, of that city, on Oct. 27, 1878. She was thirty-one years of age, had been married eleven years, but had never been pregnant. The lower part of the abdomen was filled with a tumor resting upon the brim of the pelvis and rising as high as the navel. The uterus was retroverted, of normal size, and seemed to move independently of the tumor. The wave of fluctuation could be obscurely felt throughout the abdomen. The diagnosis was an ovarian cyst, as had been Dr. Towle's previously.

A year later this woman became pregnant, was delivered on July 12, 1880, by Dr. Towle, by forceps, owing to a large fœtal head and a small pelvis; the child weighed twelve pounds, but lived only four hours. The woman made a good recovery, and at the end of the fourth week no tumor could be found, and there had been no recurrence when the patient was last seen by Dr. Towle, in January, 1882.

The disappearance of the tumor after delivery leads me to change my diagnosis, for I believe that an ovarian tumor

would not have been dissipated as a result of pregnancy, whereas it is the rule with fibroids. I believe it to have been a soft fibroid or fibro-cyst; it might have been a cyst of the broad ligament which ruptured during labor and did not recur; an ovarian tumor it could not have been.

CASE. VII.—*Two Fibroids complicating Pregnancy. Miscarriage at three and a half months.*

Mrs. K. McH., aged 33 years, was married on April 12, 1882, having ceased to menstruate a few days before. She consulted me on July 27, and reported not having menstruated since her marriage. For six months she had noticed a lump in the left side of her abdomen, which had of late increased rapidly in size, and within a few days had become sore. Micturition was frequent; she had nausea. Examination disclosed a fibroid tumor as large as a cocoanut in the left side of the abdomen; in the right iliac region was another as large as a plum. The vaginal entrance revealed a very characteristic blueish discoloration of pregnancy. The cervix was soft, as was the body of the womb felt through the anterior vaginal wall. The diagnosis of pregnancy at three and a half months, complicated with an interstitial fibroid in each horn of the womb, was unequivocal. I prescribed viburnum and cannabis indica.

On August 1st, she reported having passed something that "felt like an egg" and was followed by some hæmorrhage.

On August 4th, I removed a foul placenta, after which the hæmorrhage soon ceased.

She had a normal convalescence. The smaller tumor entirely disappeared within two months, perhaps owing, in part, to ergot and muriate of ammonia. The larger tumor remained unaltered in size; still, on Jan. 12th, the uterine cavity measured but three inches in length.

On April 17th, 1883, she reported having had no menstruation for two months. The tumor was no larger than

formerly. There was no evidence of pregnancy, yet it was suspected. Since then I have been unable to trace her.

CASE. VIII.—*Submucous Fibroid in Pelvis complicating Labor. Transverse Presentation. Delivery by Version of still-born Child. Protrusion of Fibroid through the Os. Death from Septic Poisoning.*

Mrs. E. D. R., aged 40 years, who had had one child seven years before, consulted me on March 22, 1881, with the statement that it was five weeks since she had menstruated; there was no evidence of pregnancy except a very marked blue tinge to the vaginal entrance. The uterus was enlarged considerably by an irregular hard mass, manifestly a fibroid. On April 22, the uterus had increased greatly in size, was triangular in shape, the left horn reaching nearly as high as the umbilicus. Pregnancy was diagnosticated.

As the patient lived in Somerville, I requested Dr. W. W. Dow, of that city, to take charge of her confinement. The subsequent notes are mostly supplied by him.

On Dec. 6, labor pains set in, but were feeble until the evening of December 8th, when the os was partially dilated; the child's left side presented, the head lying in the left side of the womb; the fibroid occupied the right half of the pelvic cavity. At 9, P.M., the patient was etherized by Dr. W. A. Bell, and the os slowly dilated by Drs. Dow and Bell. Dr. Dow then passed his hand into the uterine cavity round the fibroid which was larger than the fœtal head at full term. First the left and then the right foot were successively seized and brought down into the vagina, and after continuous traction, supplemented by external pressure, a still-born child weighing eight pounds was delivered. Ergotin was injected subcutaneously. The placenta came away spontaneously in fifteen minutes. Very little blood was lost. The uterus contracted well. The fibroid, which had a broad attachment to the right side of the uterus,

completely filled the dilated os and projected into the vagina as though in process of extrusion.

During the next three days ergot was administered and the vagina frequently washed with carbolized water.

On December 12th, the lochia became offensive and the pulse rose to 106 and the temperature to 101.4° F.

December 13 and 14,	Pulse 112	Temperature 102° F.	
" 15	" 118	" 103° F.	
" 16	" 120	" 101.6° F.	
" 17	" 120	" 102.4° F.	Diarrhœa.
" 18	" 120	" 104° F.	Chill.

An intra-uterine douche of carbolized water was carried past the fibroid, which had retreated from the vagina but still plugged the os, to the fundus.

December 19th, Pulse 118. Temperature 103.2° F. Intra-uterine douches.

I saw her that evening and washed out the uterine cavity thoroughly with a solution of permanganate of potash, and advised an increase of the quinine to 20 grain doses.

December 20th,	Pulse 116	Temperature 102.4° F.	
" 21st	" 120	" 102° F.	
" 22d	" 112	" 100.4° F.	Chill.
" 23d	" 120	" 102.4° F.	Chill.
" 24th	" 126	" 101.1° F.	Chill.
" 25th	" 120	" 103.6° F.	Chill.

I saw her again and suspected septic peritonitis from the abdominal distension.

December 26,	7 A.M.,	Pulse 98	Temperature 100.2° F.
" "	10 P.M.	" 118	" 105.2° F.
" 27		" 126	" 100.2° F.

Patient is evidently failing.

December 28,	7 A.M.,	Temperature 100° F.
" "	6 P.M.	" 101° F.
" 29	7 A.M.	" 100.2° F.
" "	6 P.M.	" 103.2° F.
" 30	7 A.M.	" 100.4° F.
" "	6 P.M.	" 103.2° F.
" 31	12 M.	" 99.8° F.
" "	6 P.M.	Death on twenty-third day of child-bed.

The intra-uterine douche was administered every six hours during the last two weeks of her life.

At the autopsy the uterus was found to be but little involuted, and contained a fibroid tumor eight inches in length by five in transverse diameter, deeply imbedded in the uterine wall just above the inner os on the right side, and projecting into the cervical canal, distending it as low as the external os. The surface of the tumor was superficially gangrenous, as was the whole lining membrane of the uterine cavity. It did not seem as though any attempt at enucleation of the tumor during child-bed could have been crowned with success.

The notes of the two following cases have been kindly sent me, with permission to incorporate them in my paper, by Dr. Emma Call, of this city.

CASE IX.—*Subperitoneal Fibroid complicating Labor. Septic Infection. Recovery, with complete Disappearance of the Tumor.*

Mrs. A., aged 24 years, primipara. Previous to her pregnancy she had been treated for cervical catarrh by Dr. Lucy Sewall, who had recognized slight enlargement of the womb but no tumor.

On November 27th labor set in, when a solid subperitoneal tumor, the size of a fist, was discovered projecting from the anterior wall of the uterus. The presentation was normal, but the pains were feeble and the patient exhausted, so that delivery was terminated by means of the forceps applied when head had reached the pelvic outlet. The expulsion of the placenta was followed by a severe hæmorrhage.

For the subsequent six weeks the patient had a mild form of septic infection, not attended by chills. The temperature ranged from 99° F. to 101°. The lochia was profuse and offensive for a few days, until treated by douches and suppositories of eucalyptus. The uterus was tender, especially about the tumor, and there was some effusion into the

cellular tissue on the left side. Involution was tardy, so that the patient did not leave her bed for three months, when the uterus was no longer tender and the tumor was half its former size. A year later no trace of the tumor could be detected. She is now well advanced in her second pregnancy, but, having removed from the city, is no longer under observation.

CASE X.—*Submucous Fibroid and Albuminuria complicating Labor. Septic Poisoning. Recovery without Disappearance of the Tumor.*

Mrs. B., aged 36 years, primipara, three years married. A year previous she had had a sudden severe hæmorrhage. Menstruation had always been profuse. During the last month of pregnancy her limbs were œdematous, and the urine contained much albumen and a few hyaline casts. The quantity of urine was normal, and she only suffered from insomnia.

On January 16th, 1885, labor began at midnight; the membranes ruptured at 4, A.M. January 17th, Dr. Call found the head presenting. But little progress was made in the next twelve hours, so that, after consultation with Dr. Lucy Sewall, the forceps were applied while the vertex was lying transversely in the pelvis. In spite of efforts to the contrary, the occiput rotated into the hollow of the sacrum and was with difficulty delivered. The child was still-born. After delivery of the placenta, the uterus not contracting satisfactorily, a hot intra-uterine douche was given, when a solid sessile tumor, the size of a goose's egg, was discovered projecting into the cavity from the posterior wall of the uterus. During the first week of child-bed the patient was nervous and sleepless, the pulse quick, the temperature ranging from 99.5° F. to 101°. The urine was highly albuminous, the bladder irritable. The lochia were normal, except for slight fœtor on third to fifth days, which was corrected by douches and iodoform suppositories.

On the tenth day there were two severe chills; the fundus was three fingers width above the pubes. There was slight tenderness to the left of the uterus per vaginam. The lochia were scanty and purulent, but not foul. From January 25th the patient presented the usual symptoms of septic infection, the temperature ranging from 103° F. to 105°, the the pulse 108 to 120.

On January 29th, Dr. John P. Reynolds and Dr. Sewall saw the patient in consultation with Dr. Call, and confirmed the diagnosis.

On February 1st, the symptoms began to abate, and had entirely subsided by February 10th.

On March 1st, Dr. Call found the uterus still larger than normal, with unusual prominence of the posterior wall.

On March 3d, the patient began to menstruate. The flow was moderate and without pain, but lasted eleven days.

The *results* of these ten cases of pregnancy and labor complicated with fibroids may be thus summarized:

Miscarriage, ...	1 case.
Recovery of Mother, ...	7 cases.
Death " "	2 "
Living Child, ...	7 "
Still-born Child, ...	2 "

With regard to miscarriage, it has been shown by Lefour[1] that this effect of the complication of pregnancy with fibroids is not so common as might be expected. In two hundred and twenty-seven cases which he cites, miscarriage occurred but thirty-nine times, which is once in 5.82 cases. These figures show no more liability to miscarriage than in cases of pregnancy uncomplicated with fibroids.

The prognosis for the mother, indicated by my cases, is much better than is warranted by the accepted statistics. Thus Lefour[2] states, that in two hundred and eighty-six

[1] Les fibroines utérines au point de vue de la grossesse et de l'accouchement. Paris, 1880, p. 94.

[2] Loc. cit., pp. 218-220.

cases, including those women who miscarried as well as those who went to full term, one hundred and forty-one mothers died, which is one in 2.02 cases. W. Süsserott[1] states, that in one hundred and forty-seven cases which he compiled, seventy-eight mothers died = 53%.

The rates of mortality for the mothers, above cited, I believe to be much higher than we should have were all cases to be reported, it being manifest that those cases presenting no serious results are often thought unworthy of publication.

With regard to the children, Lefour found that of fifty-two infants, thirteen were dead born. Süsserott states, that of one hundred and thirty-eight (including one case of triplets and two of twins) children, forty-seven only survived = 34%.

Regarding the position of the child at time of labor, my cases show seven presentations of the head and two transverse presentations. Lefour shows, that in one hundred and two cases there were fifty-two presentations of the head (50.98%), thirty-three of the breech (32.35%), and seventeen of the trunk (16.66%). A much larger proportion of anomalous presentations is thus shown by a comparison of the figures with those published by Depaul,[2] who had in a total of 16,233 labors of all kinds,

15,119	presentations	of the	head	=	93.1 %
633	"	"	breech	=	3.9 "
189	"	"	trunk	=	1.16 "

In each of my two cases of transverse presentations the tumor partially filled the pelvis, so that a transverse position of the child must almost of necessity have occurred. This should be borne in mind by obstetricians in the management of such cases.

[1] Beiträge zur Casuistic der mit Uterus myomen complicirten Geburten. In.-Diss. Rostock, 1870, p. 49.
[2] Lefour. Loc. cit., p. 120.

With regard to the special complication of labor induced by the presence of the tumor, the above cases illustrate the frequency of inertia of the uterus and the liability to septic poisoning in child-bed. This latter danger is hardly mentioned by the authors above quoted; but this omission on their part is attributed to the new views of the pathology of child-bed which have come to prevail since the cases occurred of which their compilations are largely composed.

The presentation of a large tumor at the external os, as in Case VIII., immediately after delivery, would seem to be almost a unique observation, though several cases are cited in which a tumor thus presented in the later days of child-bed. As septic poisoning, with fatal result, occurred in this case, when no attempt at enucleation was made, it may be fairly doubted whether an operation would not have determined a different issue. The post-mortem condition, however, seemed to confirm our previous belief that any operation for removal of the tumor would have been very difficult, very bloody, and, if successful, have left an immense wound for the absorption of septic matter.

The degree of danger to which the woman is exposed in these cases undoubtedly depends greatly upon the precise location of the tumor. Thus in Cases II., III., IV., V., VI. and IX., the tumors appeared to be subperitoneal, and all passed through labor and child-bed without complication, except for slight septic infection in Case IX. In Cases I., VIII. and X. the tumors were sub-mucous, and two died, while the third recovered after septic infection in child-bed. The location of the tumor in the lower segment of the uterus, so as to interfere with the delivery of the child, introduces the most serious element of danger during delivery. Should this condition exist, and a vigorous attempt under ether to elevate the tumor from out the pelvis early in pregnancy fail, induced abortion or at least premature labor would be the safest course to pursue.

Regarding the effect of pregnancy and labor upon the tumors, my cases demonstrated, in accordance with the accepted teachings, that the tumors increase enormously in size with the progress of the pregnancy. After labor, however, the current belief is that the tumors return to the size from which they started before pregnancy. That this is an error would seem to be made clear by the fact that in six of the eight patients who survived, no trace of the tumors could be found post-partum, at observations recorded after an interval varying from two weeks to twelve months respectively (Cases II., III., IV., V., VI., IX.). In Case VII., in which miscarriage occurred at three and one-half months, one tumor was entirely absorbed, and the other was unaltered in size. In Case X., the tumor was sessile and only as large as a goose egg, but appears not to have been absorbed.

The above experience would seem to warrant the following deductions, which do not make a part of the doctrines hitherto prevalent upon the subject.

As aids to *diagnosis*, the following points should have great weight:

1.—An area of flat percussion beyond the limits of the tumor or tumors.

2.—Unduly rapid growth of a fibroid.

3.—Blueish discolorations of the vaginal entrance.

As to *treatment:*

4.—That intra-uterine disinfectant douches should be administered throughout the puerperal period in all cases, even before the supervention of symptoms.

As to *prognosis:*

5.—That fibroids are, as a rule, absorbed during involution of the uterus or soon after.

[illegible]

ARTICLE XX.

THE PATHOGENESIS OF CERTAIN AFFECTIONS OF THE SKIN.

By GEORGE H. TILDEN, M.D.
OF BOSTON.

READ JUNE 9, 1885.

THE PATHOGENESIS OF CERTAIN AFFECTIONS OF THE SKIN.

"Diseased nature oftentimes breaks forth in strange eruptions."

It is well known that the introduction of various drugs into the stomach is sometimes followed by the appearance of a cutaneous eruption, and that the connection between them is one of cause and effect. One of the most common of the so-called medicinal eruptions, consisting of the acneiform, pustular and sometimes furuncular lesions due to the administration of the iodide or bromide of potassium, has been attributed to direct irritation of the glands of the skin because of the attempted cutaneous elimination of the drug from the system, and the detection of iodine and bromine in pus obtained from the cutaneous lesions gives to this idea apparent support. The histological character of such lesions, however, according to Duckworth, does not indicate that the cutaneous glands are primarily involved, while more recent microscopic investigation shows that although lesions caused by the internal use of iodine and bromine preparations may originate in dilatation and cellular infiltration of the capillary network which surrounds the sebaceous glands, the same process also affects bloodvessels which have nothing to do with the glandular apparatus of the skin, and may develop to such an extent that the consequent lesions represent a pustular dermatitis. The attribute of an eliminative pathogenesis, therefore, cannot be given to this variety of eruption

until more evidence in its favor is forthcoming, although the occasional inception of the process in the neighborhood of the cutaneous glands is suggestive of the ancient maxim, *ubi irritatio, ibi affluxus.*

Other forms of cutaneous lesions may also arise from the internal use of iodine and bromine compounds, and offer for consideration a large class of medicinal eruptions which differ in appearance from those just mentioned, and are independent of the physiological or therapeutic action of the drug to which they are due. They may be caused by many different drugs, and present a variety of forms, the most common and well recognized of which are as follows:

1.—Simple and evanescent erythematous patches, unattended by constitutional disturbance, and not apt to be followed by desquamation, which have been observed after the use of quinine, antipyrin, copaiba, iodide and bromide of potassium, cubebs and benzoate of soda.

2.—Papular erythematous lesions, attended with exudation into the cutaneous tissues, and resembling in some cases measles, in others the various forms of erythema multiforme, have been produced by the ingestion of quinine, antipyrin, copaiba and iodide of potassium.

3.—A diffuse form of erythematous dermatitis, not unfrequently accompanied by constitutional derangement, generally followed by desquamation and often closely simulating the rash of scarlet fever, has occurred in consequence of the administration of salicylic acid, quinine, opium, morphia and iodide of potassium.

4.—An urticarial eruption, consisting of wheals, is the most common of the medicinal eruptions, is apt to be combined with other forms and attended with constitutional disturbance, and has been described as following the use of copaiba, quinine, salicylic acid, antipyrin, iodide and bromide of potassium, opium, morphia, chloral hydrate and arsenic.

5.—Purpuric eruptions or circumscribed exudation of

blood into the dermal tissues, sometimes accompanied by hæmorrhages from the mucous membranes, are reported as having occurred from the use of quinine, salicylic acid, iodide of potassium and chloral hydrate.

Much less common than the above are:

1.—Bullous or pemphigoid eruptions. Such cutaneous lesions occurring after the use of iodide of potassium are rare, but well recognized, and isolated instances of the same are recorded as taking place after the use of bromide of potassium and copaiba.

2.—Vesicular eruptions resembling eczema have been described as following the use of various drugs, but they are exceptional, and the details with regard to them are meagre.

Attacks of typical herpes zoster are described by Hutchinson and others, as occurring during the administration of arsenic; but it is a question whether such eruptions are not to be regarded as coincidences rather than consequent phenomena.

3.—A scaly eruption, resembling psoriasis, is mentioned by Gower as appearing, in three cases, during the administration of borax.

The drugs which are most apt to excite cutaneous eruptions, when given internally, are quinine, salicylic acid, copaiba, preparations of iodine and bromine, and it is worthy of notice that the new remedy antipyrin is especially prone to give rise to cutaneous manifestations, being followed by them, according to one observer, in ten per cent. of the cases in which it is used. Contrary to the opinion of Besnier, who supposed them to be due to reflex nervous disturbance, caused by gastric irritation, these eruptions may ensue, whether the drugs which excite them are introduced into the system by way of the stomach, by absorption through the mucous membrane of the rectum, by subcutaneous injection, or by contact with a wounded surface. They make their appearance shortly after absorption of the

drug has taken place, are acute, and run a rapid course in comparison with the pustular dermatitis due to iodine and bromine; are not unfrequently ushered in by a chill and accompanied by vomiting, headache and fever, offering a temporary but striking likeness to the acute exanthemata; are aggravated by the continuance or increase in the dose of the drug which causes them, and disappear upon its disuse. In some cases, however, the system seems to acquire a tolerance of the drug, and the cutaneous and other symptoms disappear notwithstanding its continued administration.

The pathogenesis of the medicinal eruptions is of importance as throwing light upon other and analogous pathological processes, but its nature is too complicated, and our knowledge too limited, to permit any such syllogistic and sweeping assertion of its neurotic character as has recently been made in the Journal of Cutaneous and Venereal Diseases.

With regard to the pustular lesions, so often caused by the use of iodine and bromine compounds, the evidence, taken for what it is worth, indicates that the changes in the skin are due to direct irritation of its tissues, on account of the presence therein of iodine and bromine—two very irritating substances. The deposition of finely divided metallic silver in the corium and consequent discoloration of the skin, which sometimes follows the long continued administration of nitrate of silver, demonstrates the possibility of the accumulation of a drug in the cutaneous tissues after its internal use, while the typical inflammatory and suppurative character of the lesions in question suggests reaction to direct irritation, and the detection of iodine and bromine furnishes the material for such irritation. In most cases these inflammatory changes in the skin do not appear until the drug has been taken for some time, and personal idiosyncrasy does not seem to play so prominent a part in their causation as in that of the other varieties of medicinal

eruptions, there not being manifest the same general condition of vascular irritability which is often connected with the latter. The production of the pustular dermatitis caused by iodine and bromine, seems rather to be a question of the amount of the drug received into the system compared with the individual's capacity for its elimination by the proper channels; an interesting fact in this connection being the observation, that in cases of Bright's disease, where the eliminating powers of the kidneys are crippled, this form of eruption takes place sooner and after smaller doses of the drug than usual.

As to the other varieties of medicinal eruptions, although they differ widely from each other in appearance, many of them are due to what looks like disturbance of the vasomotor system, and belong to the so-called angio-neurotic lesions of the skin, the type of which is furnished by the wheal of urticaria; and both Pellizzari and Erb call particular attention to the general and increased irritability of the cutaneous vascular system, which is present in these cases, a condition of things revealed by the ready formation of the so-called "taches cérébrales," first pointed out by Trousseau in connection with meningitis. Pathologically speaking, angio-neurotic lesions of the skin consist in various and varying degrees of dilatation of its capillaries, attended with more or less exudation of serum and wandering cells, separately or in combination, and such processes manifest themselves clinically by erythema of various types and urticarial eruptions. With regard to the bullous eruptions due to iodide of potassium, it may be stated that an angio-neurotic lesion of the skin, such as erythema or urticaria, may, by sudden and excessive exudation of serum, which causes the elevation of the epidermis "en masse," develop into a bullous eruption, and it is a question as to how many of these pemphigoid lesions are of this nature. For the production of the hæmorrhages into the cutaneous tissues

which take place in the purpuric eruptions, there is apparently necessary some change in the capillary walls themselves, for the red blood globule does not possess the power of amœboid movement which enables the white blood cell to migrate through the protoplasm, of which the walls of the capillaries are composed. This process is generally independent of any angio-neurotic manifestations, although it may be combined with them and thus give rise to a hæmorrhagic variety of such lesions. In what manner the presence of a drug, or some modification of the same, in the system, causes such pathological changes in the skin; whether by disturbance of the central or peripherical nervous system, by irritation of the capillaries themselves, or by a combination of the two processes, is a matter of speculation which is premature in proportion to the extent of our ignorance, but the truistic assertion may be made, that the entrance in some way into the circulatory system, of the drug which causes them, is requisite for the production of these eruptions. In any individual instance, the factor which seems to determine the morphology of the eruption is personal idiosyncrasy, or what Virchow has called, the "mystery of individuality," the same drug generally causing the same form of eruption in the same individual, and it is an interesting fact that such idiosyncrasy may be hereditary.

The entrance into the circulation of vaccine matter and so-called septic material is also competent to excite pathological changes in the skin. In vaccination, besides the more common and localized eruptions of erythema, eczema, and erysipelas, which start from the point of inoculation and spread by continuity, there sometimes occur exanthemata, which appearing after a certain period of incubation, upon regions of the body distant from the point of inoculation, often resemble in appearance angio-neurotic eruptions, and are apparently due to entrance into the circulation of vaccine matter, or possibly in some cases, as

Behrend supposes, of the products of suppuration which has taken place at the point of inoculation. During the course of diphtheria and other septic processes, and notably puerperal fever, there not unfrequently occur eruptions of the angio-neurotic type, being made up of erythematous and urticarial lesions, and probably the so-called puerperal scarlet fever and the "scarlet fever" after operations are of a septic nature and not genuine scarlatina. Bullous and very commonly purpuric lesions may also ensue in consequence of septic infection, and several observers have expressed the opinion that all cutaneous lesions, occurring as a result of such infection, are metastatic in character; and although this may not be true of all, it is not unlikely that the petechial lesions are of this nature, namely, hæmorrhagic infarcts of the skin caused by plugging of its capillary bloodvessels by emboli composed of micro-organisms, more especially as some recent microscopic observations, by Watson Cheyne, of the lesions occurring in purpura hæmorrhagica, seem to confirm this idea.

In the cases already considered, the foreign material or "materies morbi" which excites cutaneous manifestations of its presence in the system, is introduced into the organism from the outside, and this may also be said of the acute and contagious exanthemata, of typhus and typhoid fever, of glanders, of syphilis, of the oriental pest, and of infectious maladies, where cutaneous eruptions are exceptional and not characteristic of the disease, such as cholera, relapsing fever and acute miliary tuberculosis; but instances are not wanting in which similar appearances may be caused by the formation in the organism itself of material which by its presence in the blood is competent to give rise to changes in the skin, and examples of this are furnished by scurvy, uræmic poisoning and diabetes.

Chemical examination of scorbutic blood shows, besides other changes in its composition, increase in the amounts of

water, fibrin and albumen, and decrease in the quantity of its globular elements, and these changes which are apparently caused by exposure to hardship combined with deprivation of certain articles of diet, notably fresh vegetables, are attended by the development of purpuric lesions in the skin and hæmorrhages into other tissues of the body. There is no reason for supposing scurvy to be an infectious malady, and the suggestion that the purpuric lesions of the disease may be due to the influence of the same micro-organisms which are ordinarily harmless denizens of the mouth and other cavities of the body, but which in these cases are furnished with unusual opportunities for growth and development on account of the altered composition of the blood, is a curious instance of bacterio-mania.

In chronic diminution or complete arrest of the renal functions, the consequent retention in the blood of waste products which should be eliminated by the kidneys, usually manifests itself by headache, symptoms of gastric disturbance, and in severe cases by coma, but occasionally there are likewise produced cutaneous symptoms, consisting of a papular form of erythema, attended with exudation and followed by desquamation, which has been described under the name of erythema uræmicum. This form of eruption usually makes its first appearance upon the extremities, notably upon their extensor surfaces, and subsequently spreads to other parts of the body. Confluence of the original lesions sometimes causes the eruption to assume a likeness to that of scarlet fever, and in one case of unusual severity bullæ and purpuric lesions were formed in the skin and hæmorrhages took place into the mucous membrane of the mouth.

The cutaneous manifestations which occur during the course of diabetes, apparently in consequence of the over production of sugar in the system, have been made the subject of a special article by Kaposi, and may be of the angio-

neurotic type represented by roseola, erythema and chronic urticarial lesions, or of a more frankly inflammatory nature, consisting of furunculosis, carbuncular lesions and even gangrenous dermatitis. The presence of sugar has been demonstrated in these inflammatory lesions, which call to mind the similar cutaneous changes caused by iodine and bromine.

The eruptions which have thus far been mentioned are, properly speaking, not diseases *of* the skin, but changes *in* the skin, which are symptomatic of the presence in the circulation of some material which is foreign to the organism, and which either enters into it from without or is the result of perverted and incomplete performance of its physiological functions. In a crude way they may be arranged in three groups, namely, those of an angio-neurotic nature, represented by the various forms of erythema and urticaria; those of a reactive inflammatory and suppurative type, consisting in acneiform, furuncular and carbuncular lesions, and those of a hæmorrhagic variety, manifested by purpuric eruptions, and it is worthy of notice that eczema, which is so common a disease of the skin, is so rarely met with in this connection.

The pathological changes in the skin, which are regarded as cutaneous diseases properly so called, are not unfrequently purely symptomatic in their nature, and a rational method of treatment does not lose sight of this fact, although the exact indications to be met are often obscure or entirely unknown.

The acute outburst of urticaria, sometimes accompanied by vomiting and febrile symptoms, which occurs after the use of certain articles of food in susceptible individuals, has its exact counterpart in the similar eruption following the use of various drugs, and many strange examples of such personal and gastronomic idiosyncrasy are recorded. The typical and self-limited course of erythema multiforme, erythema nodosum, and certain varieties of purpura; the

prevalence of these diseases during the spring and autumn the individual susceptibility which renders the patient liable to renewed attacks with the return of these seasons; the general feeling of languor and debility and arthritic pains which are often evident, and the occasional development of cardiac murmurs during the course of these maladies, all go to show that their cutaneous lesions are merely symptomatic of some general and possibly infectious influence, the exact nature of which is entirely hypothetical.

The chronic varieties of erythema and urticaria, on the other hand, which by recurring attacks form such an unpleasant feature in the existence of the sufferers therefrom, are symptomatic of some disturbance of the various physiological functions of the body, and external applications have upon them but a temporary and palliative effect. They may often be associated with manifest symptoms of dyspepsia, with costiveness and with improper modes of living, in which case the appropriate and generally effective remedy is to set right whatever is wrong, so far as lies in our power. The evil effects of the incomplete performance of the digestive and excretory functions are not limited to symptoms referred to various parts of the alimentary canal, and may even make themselves felt without any marked manifestations of the latter, and the lassitude, drowsiness and general debility so often met with in these cases are probably but milder manifestations of changes in the blood which may even result in symptoms of coma, such as have recently been described as following and probably caused by dyspepsia. A sedentary life in a vitiated atmosphere, and improper food, are to many the ordinary conditions of existence, and plenty of fresh air, physical exercise and regulation of the habits and diet are often more called for than drugs; but occasionally instances are met with where there is no obvious derangement of any but the cutaneous system, and where the functions of digestion and elimination are performed with regularity and apparent

completeness, and consequently our therapeutic efforts must sometimes be made at random. But the facts which come within the narrow limits of personal experience, that such cases are sometimes much relieved or even cured by the administration of salicylate of soda, atropia, or by a thorough going course of purgative waters, are suggestive of future possibilities in the way of therapeutics, when our knowledge of the action of drugs and the indications for their employment is more exact than it is at present. There is no doubt also that eczema and other cutaneous disorders which are not so purely symptomatic in their nature as those already mentioned, may be aggravated and kept up by similar conditions of the system, and a strict attention to the functional integrity and vigor of the body, in addition to local treatment, is often necessary to secure a successful result. Disturbance of the nervous system and exudative or inflammatory tissue changes are but the machinery of pathology, which is set in motion by what in the broadest sense of the word may be called irritation, and doubtless one form of such irritation is change in the composition of the blood by quantitative or qualitative modification of its various constituents, or by the introduction of foreign material, and the patient who makes the traditional demand for its purification may, in many cases, be nearer the source of his malady than the physician who is busy with the symptoms. However clumsy and ineffectual our therapeutic efforts may be, they should not be employed without a clear recognition of the close relations existing in matters of pathology between the body and its cutaneous envelope, which renders Dermatology, of all the special departments of medicine, the least independent of general pathological states of the system.

ARTICLE XXI.

DIAGNOSIS AND TREATMENT OF POSTERIOR POSITIONS OF THE OCCIPUT.

By WILLIAM L. RICHARDSON, M.D.
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DIAGNOSIS AND TREATMENT OF POSTERIOR POSITIONS OF THE OCCIPUT.

CALLED to a case of labor the physician promptly responds. According to the account, given by an intelligent nurse, the labor has been going on two or three hours. The patient's condition, both mental and physical, is good. A vaginal examination discovers the os uteri to be one-third dilated, the child's head presenting. Having assured all the interested parties of the perfectly satisfactory condition of the situation, the doctor hastens away to complete the work of the day, so as to be on hand when his services shall be required. A few hours later he finds the os uteri fully dilated, the head somewhat descended, although not quite so far as he had anticipated, and, again congratulating the patient and her friends on the favorable progress of the case, he once more hastens away to make the remaining one or two visits, possibly revolving in his mind, however, the conscious surprise that he experienced in not finding the head further advanced. Returning in an hour, his work for the day done, the head is found to be a trifle lower, the pains excellent, but the woman somewhat tired. Realizing that the end is not far off he awaits the termination of the labor, which is now, in his opinion, close at hand. Time passes; the pains are all that could be desired, but the child is not born. Flattering himself that the head is lower, at least it ought to be and he hopes that it is, he waits. One, two hours go by; the woman, like the doctor, becomes impatient, but

there is no progress, except what the doctor tries hard to imagine. The patient's pulse, as well as her mental condition, is beginning to show the effect of the labor. It is evident that something must be done, and, as all that is needed is a little help, the aid of the forceps is invoked. Assuring the patient and her friends that the operation really amounts to nothing and that in a few moments, without further suffering, the child will be born, the patient is etherized, the forceps are applied, traction is exerted and the forceps begin to slip. Surprised, disappointed, wondering and with some misgivings, the forceps are reapplied only to slip again; the head remains where it was. A more careful examination is now made, but no light is thrown on the problem, and the puzzled attendant asks for the assistance of a friendly professional brother. He arrives, but somehow the forceps again fail to work. The case begins to look serious. At length, after alternate pulling on the handles and readjusting of the blades, the child is delivered stillborn; the perineum is sewed up and the doctors retire homeward, each explaining to the other what the trouble was, and, at the next meeting of the local medical society, the doctor reports the case as one of difficult forceps, owing to a slight, though undescribed, pelvic deformity. The nurse, if very intelligent and observing, wonders to herself why the face, when it escaped from the vulva, looked forward instead of backward, and the youngest member of the local society, fresh from the medical school, suggests that the trouble might have been due to an unrecognized posterior position of the occiput, and consequently a wrong application of the forceps; a suggestion received with that silent smile of experience which at once sets the young man to thinking and possibly also some of the older members of the society.

The above sketch is the clinical history of not a small number of obstetric cases; the above undescribed but assumed pelvic deformity the cause of a fair proportion of stillborn children.

Two years ago, asked by the students of the Harvard Medical School to lecture on the mistake which, when called in consultation, I most frequently saw made by physicians, I spoke on the diagnosis and treatment of this class of cases. Asked by the committee in charge to prepare something for this annual meeting of the Massachusetts Medical Society, I could think of no more practical subject, and therefore offer the following brief paper on the Diagnosis and Treatment of Posterior Positions of the Occiput, occurring in a normal pelvis and with a normal fœtus at full term.

The careful obstetrician is one who recognizes that for an intelligent attendance on a case of labor a knowledge of the fœtal position is just as important as a correct diagnosis of the presentation. As a rule, however, practitioners usually content themselves with making out the presentation, and, having assured themselves that the head is presenting, consider the position a matter of minor importance, knowing that cephalic presentations usually come out all right. Now, as a matter of fact, it is in these head presentations that a comparatively slight deviation from the usual position can occasion more difficulty than in any other, for the reason that the deviation is usually unrecognized and the assistance often rendered, when the case does not progress as the practitioner had anticipated, is consequently unscientific and not unfrequently precisely the reverse of that which the condition demands.

The neglect to make out the position until some unexpected and unexplained delay renders such knowledge imperative, allows the formation of a caput succedaneum. This of itself often renders any attempt to make out the diagnosis per vaginam a matter of considerable difficulty; while the œdema of the vagina in advance of the presenting part only adds to the obscurity of the problem.

The diagnosis of a position would be rendered much easier if the practitioner would avail himself of the great advantage to be gained by the use of external palpation.

Fourteen years ago (1871) I read at the annual meeting of this Society a paper on the use of External Manipulation in Obstetric Practice, showing with what ease the presentation could be made out by this method of examination. The paper contained nothing original, being simply a statement of the teaching in Vienna at that time. My attention was subsequently called to a paper[1] read in 1869 by Dr. J. T. Whittaker, before the Cincinnati Academy of Medicine, on "The Examination by Palpation of the Pregnant Abdomen," which was also a resumé of the practice in Germany. In 1872, Dr. J. R. Chadwick published[2] a more detailed account of the continental methods of making external examinations. In 1873, and again in 1875, Dr. Frank C. Wilson published[3] papers on "Fœtal Physical Diagnosis," with, however, special reference to the value of auscultation. In 1879, Dr. Paul F. Mundé published[4] an admirable article on the "Diagnosis and Treatment of Obstetric Cases by External Manipulation." None of these writings, however, contained any special directions as to the method of differentiating the posterior from the anterior positions of the occiput,—Dr. Mundé, whose paper was the most elaborate, dismissing occipito-posterior positions as "merely abnormal rotations or arrest of rotation of the two regular vertex presentations."

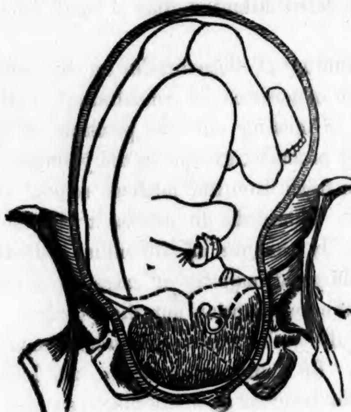
In 1878 Prof. A. Pinard, of Paris, published a most admirable monograph on Abdominal Palpation, which has recently (1885) been translated into English by Dr. L. Ernest Neale, of Baltimore, in which he treats in detail of the differential diagnosis of the posterior and anterior positions. This is, so far as I know, the first published account of how such a differential diagnosis can be made out. Some points that will aid the practitioner in arriving at a

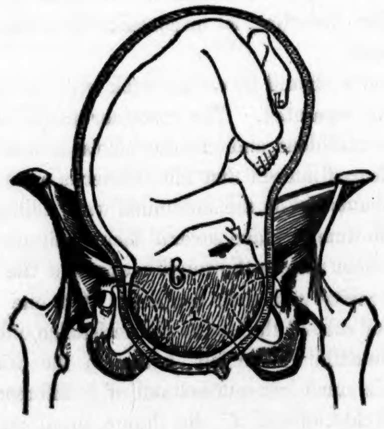
[1] Philadelphia Medical and Surgical Reporter, Nov. 20, 1869.
[2] Boston Medical and Surgical Journal, Aug. 15 and 22, 1872.
[3] American Practitioner, July and October, 1879.
[4] American Journal of Obstetrics, July and October, 1879.

correct diagnosis are, however, not touched upon in Prof. Pinard's article, and it is to these as well as to those to which he has called attention that I shall briefly allude in this paper.

Notwithstanding all these articles on the subject, judging from my own experience in consultation with physicians, this method of making out the position of the fœtus in utero is rarely practised except by the younger members of our profession fresh from the medical school or the continental clinics. Those who do practise it will, however, agree with me that, by the use of abdominal palpation, we are enabled, in the great majority of cases, to accurately make out not only the presentation but the position; a diagnosis which should always be subsequently confirmed by a vaginal examination. In many cases where the labor has been tedious and the progress slow the diagnosis per vaginam is difficult, unless it be preceded by an external examination, by which we can often easily make out the probable condition. This once known, a subsequent verification of the position by a vaginal examination is a matter of comparative ease. First, therefore, let us consider the method of making the diagnosis.

The woman should lie on her back with the legs extended and slightly separated. The examiner should stand on the level of the umbilicus, and on either side as is most convenient. Having assured himself that the bladder is empty, he should place his hands flat on the abdominal wall, telling the patient at the same time to make several deep expirations. In this way he is soon able to thoroughly examine the uterus and the pelvic cavity with their contents. On one side of the longitudinal axis of the uterus the resistance offered by the back of the child will be felt, while on the other side the resistance is much less marked and of a different character, being only that offered by the liquor amnii and the fœtal extremities. The location of the dorsum is thus easily made





out, and the occiput must be on the same side. Is it anterior or posterior? If it is posterior a more limited resisting surface is felt, and one which is more marked the farther one goes from the median line and the nearer the palpating hand reaches the lateral border of the uterus. If it is anterior the resisting surface passes to a greater or less degree over the median line, and, in many patients, the fœtal vertebral column can be distinctly made out, which of course can never be done if the position is posterior. Moreover, as Pinard has noticed, the frontal end of the child's head being higher up in the mother's abdomen than the occiput, is first reached by the hands of the examiner, and as the fingers approach nearer and nearer to the symphysis pubis the one which is on the side towards which the face points is first arrested, the flexion of the head allowing the hand over the occiput to pass lower into the pelvic cavity.

There are of course cases in which, owing to an unusual thickness of the abdominal wall or a large amount of liquor amnii, it is not possible to so accurately map out the fœtal outline in the manner described as to say positively whether the occiput is anterior or posterior. But even in these cases an external examination will rarely fail to greatly facilitate the determination of the position. Those cases must be very exceptional in which we cannot, with absolute certainty, say on which side of the longitudinal uterine axis the back of the child lies. Given the situation of the back in the uterus, we know that the occiput, as has been already said, must be on the same side of the pelvis.

From a careful examination made early in labor of nearly 1000 cases (981), occurring in my own practice and at the Boston Lying-In Hospital, I find that the head entered the superior pelvic strait in the right oblique diameter in 963, or 98 per cent. Nægelé, whose work on the subject has become classical, states that this occurs in 99 per cent. of all cases. I am aware that Dr. R. U. West takes exception

to Nægelé's statement,[1] and claims that the head so entered the pelvis in only 60 per cent. of a large number of cases in which he had an opportunity of making an early examination. The limits of this paper preclude any attempt to discuss West's elaborate paper on the subject, which I think, however, open to several serious criticisms. My experience is in accord with the views of Nægelé, whose statement has also been accepted by nearly all the recent writers on the subject. If, therefore, an external examination shows us that the back of the child is in the mother's left, we know that the position must be that usually known as the first or occipito left anterior; for all observers, including even West, agree that the fourth or occipito left posterior is so rare as to be considered only as a very exceptional possibility. If, on the other hand, the child's back is found in the right, we may be dealing with either the second or the third position, that is, with an occipito right posterior or anterior. A vaginal examination will, however, in many cases at once determine the position. If per vaginam the examining finger finds that the head is only just engaged at the superior strait, it is in all probability a posterior position; for it is in that diameter that the head usually enters the pelvis. If, on the other hand, the head has begun its descent, it may be either. It will enter in the right oblique; as it descends it may or may not have rotated, and an examination of the sutures and fontanelles will alone determine whether rotation has begun or not. In every case an examination per vaginam of the sutures and fontanelles should of course be made, for the purpose of confirming the diagnosis thus already made out. Practitioners who have never accustomed themselves to practise external examination will be astonished to find how, in the great majority of perplexing cases, the vaginal confirmatory examination will be found to be greatly facilitated by the knowledge previously acquired by manipulation of the abdomen.

[1] Glasgow Medical Journal, October, 1856, and January, 1857.

So much then for the diagnosis of posterior positions, and on their early recognition will the successful management of many of them depend. Some, in fact the great majority, take care of themselves; but every now and then the practitioner meets a case such as I attempted to describe in the beginning of this paper,—a case in which his neglect to early recognize the position allowed the patient to go from bad to worse, and resulted in an unscientific interference terminating in a way which is a disgrace to our knowledge of the true mechanism of labor.

One unvarying principle in this mechanism is, that the part of the fœtus which is the lowest in its descent through the pelvis, must rotate forward under the arch of the pubes whenever it reaches the resistance offered by the lower pelvic strait. If the occiput presents in the posterior position as the labor progresses, and the head descends, the occiput must, therefore, when it reaches this resistance, rotate forward and become an anterior position. If, as the head descends, no such rotation takes place, it can only be because some other part of the head than the occiput has first reached the point where resistance is encountered, and that part therefore, instead of the occiput, is then forced forward. This of course can only happen when there is lack of complete flexion, and, as a consequence, some other part of the fœtal head than the occiput is lower and first meets resistance. In other words, whenever we find that a head presenting with the occiput posterior fails of an occipital forward rotation, we know that we are dealing with a head more or less extended. As the head in such cases descends, the expulsive force must act by driving the sinciput, which is the lowest part, forward, and the occiput necessarily turns backwards into the hollow of the sacrum into which it is crowded, thus more and more shifting the pressure on the long arm of the lever and increasing the extension, the occipito-frontal diameter of the head taking the place of the

sub-occipito-bregmatic. This gradual extension is readily detected by the greater ease with which the examining finger reaches the anterior fontanelle the lower the head descends.

The treatment of cases of occipito-posterior positions should be in the main what one might call prophylactic. The great majority of them require no treatment, beyond a careful watching on the part of the attending physician. Governed by the principle that the lowest part of the presenting head must rotate forward, the occiput, though originally posterior, when it reaches the floor of the pelvis is rotated forward and assumes an anterior position. Rotation of the frontal end forward does, however, occur, as has been said, whenever there is a failure of proper flexion. West reports 79 such cases out of 2,585, a little over 3 per cent. It is to be regretted that in his admirable paper on the subject he does not tell us in how many of the whole number of cases the occiput presented posteriorly, in order that we might know in what percentage of such cases a failure of forward rotation of the occiput occurred. When such failure of forward occipital rotation occurs, the case at once becomes one involving more or less difficulty according as the head becomes more and more extended; the difficulty being of course only slight when there is only slight extension, and being most marked when extension is so great that the original vertex presentation has become converted into one of the face. The successful treatment of these cases must depend largely on the time when the diagnosis of failure of proper flexion has been discovered, and the manner in which the attendant attempts to remedy the difficulty.

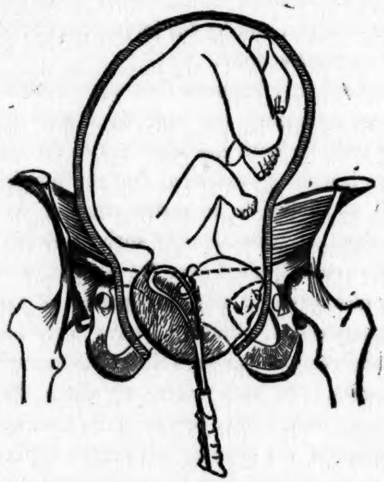
The diagnosis of a posterior position of the occiput having been made, the progress of the case should be carefully watched, with a view of an immediate detection of any failure of proper flexion. The posterior fontanelle should always be easily reached, while the lower the head descends the greater the difficulty in touching the anterior fontanelle,

on account of the crowding of the frontal end of the fœtus against the symphysis pubis. If at any time during the progress of the case the posterior fontanelle remains stationary while the anterior is becoming more and more easy of access, the attendant is at once conscious of a gradual extension of the head. It is at this time that an intelligent interference with the case can be of the greatest service. The fingers of the right hand, if the occiput be to the mother's right, should be applied to the frontal end of the head, and, during a pain, a firm resistance, not pressure, should be kept up to prevent any further descent, and the actual flexion of the head should be left to the pressure exercised on the occipital end by the force from above occasioned by the uterine contractions.

It not unfrequently happens that the physician does not see the case, or seeing the case does not recognize the threatening trouble, until the labor has so far advanced and the head has become so extended that the simple application of pressure, as advised in an earlier stage of the case, is no longer practicable. Occasionally such pressure, in conjunction with the vectis applied over the occiput, will, according to some writers, even at this late period of the labor, be found to be successful, although I have never been able myself to use the vectis under such circumstances with any very marked success. In such cases, or where the vectis has been tried and failed, I have several times been able to rectify the malposition of the head by a different application of the forceps from that in which they are generally used. It is to this method of delivery by forceps that I would especially call the attention of the members of the Society.

Where in posterior positions of the occiput the head has become to any degree extended, the use of the forceps, as usually applied, only serves, when traction is made, to increase the extension, thus facilitating the change of an occipital into a face presentation. The object I have en-

deavored to obtain in the use of the forceps in this class of cases, is not only the descent of the head but its flexion. Several times at the Boston Lying-In Hospital and in my own private and consultation practice, I have been able to overcome the existing difficulty, and to effect both the descent and flexion and consequent rotation of the head, by the application of the forceps reversed, that is, with the convexity of the pelvic curve toward the pubes instead of toward the hollow of the sacrum as is usual. To effect this change of flexion, the blades should be introduced in such a way that



the cephalic curve should pass over the ears of the child, the tips resting on the occiput. When traction is exerted, the forceps being so applied, the result must be that the main force of the traction is expended on the occiput, and, as the result, the occiput is drawn down and the head tilting on its attachment to the spinal column yields to the leverage

thus applied, and the frontal end being forced up the flexion of the head is at once established, and the occiput becomes the lowest part; the case can then be left to nature, and the forward rotation of the occiput soon takes place. The flexion is often facilitated by pressing the frontal end of the head upwards with one hand, while the occiput, held firmly within the blades of the forceps reversed, is drawn downwards with the other. If, owing to some emergency, immediate delivery is demanded, the forceps should always be taken off after the head has been flexed and then reapplied in the usual way, and the delivery effected; the operator favoring during the traction the forward rotation of the occiput. The extraction of the head with the forceps reversed is not a safe procedure, the tips of the blades tending to produce lacerations in the floor of the vagina and of the perineum.

In three cases, where all efforts at restoring the normal flexion of the head had failed, and the descent of the head had become arrested, owing to a want of adaptability between the fœtal and pelvic diameters, I have seen further delay avoided and a successful and comparatively speedy result obtained to both mother and child by completely extending the head, thus converting a brow presentation at once into the most favorable variety of face presentation, namely, that in which the chin presents under the pubic arch.

The object sought in the preparation of the paper has been to insist upon the necessity of early making out the position, as well as the presentation, in every case of labor; the great advantage to be gained from the practice of an external palpation of the abdomen; in cases of posterior positions of the occiput the importance of an early recognition of any lack of flexion which will be liable to prevent the subsequent forward occipital rotation; the danger, if forceps are applied to an extended head so situated, of still further increasing

the extension, and the ease with which traction, applied on the occiput by means of the forceps reversed, not only restores the lack of flexion, but also facilitates the forward rotation of the occiput and the speedy and successful termination of the labor.

ARTICLE XXII.

SOME OF THE MENTAL ASPECTS OF NERVOUS DISEASE.

By HENRY R. STEDMAN, M.D.
OF BOSTON.

READ JUNE 9, 1885.

SOME OF THE MENTAL ASPECTS OF NERVOUS DISEASE.

THE object of this paper is, in general, to direct attention to the relationship between physical and mental disease (to make a distinction of terms more convenient than sound), but more particularly to demonstrate the close affinity existing between the nervous and mental forms of disease. For this purpose I have grouped together several of the prominent nervous affections, giving the chief mental manifestations which are found associated with the different forms. I have also pointed out how these mental phenomena differ essentially according as the disease is structural or functional (i. e. due to discovered anatomical lesion or not), and have touched upon some of the pathological and clinical relations of individual nervous disorders to mental change. By this means I hope to suggest a more comprehensive idea of nervous disease than is prevalent. As I have merely attempted to prompt inquiry in the direction indicated by touching upon prominent points of practical and general interest, and as time will not allow more than a superficial treatment of a subject so extended, its consideration is confessedly incomplete.

A distinguishing feature of the numerous nomenclatures of insanity which have been proposed during the last twenty years, has been the tendency to classify mental diseases according to the various bodily disorders or physiological states which have been believed to be the most potent factors in their causation. This has shown increased recognition of the fact, that in the interdependence of the various parts of

the organism in disease, development and decay, the cerebral changes underlying insanity play a prominent part.

While it must be admitted that a classification of this kind—by causes—is far from trustworthy as a system of grouping the essential characters of disease, it certainly helps to stimulate inquiry as to the association of mental and bodily disorders, and by thus taking insanity from its isolation as an independent affection, its importance in medicine becomes more generally recognized, and consequently far greater clinical interest is excited. Phthisis pulmonalis, syphilis, rheumatism, cardiac disease, even diabetes are some of the diseases of the body proper which are known to be not infrequently expressed in part by psychical disturbance, amounting in some cases to actual insanity. Indeed, so extended has become the field of observation through the vast accumulation of recorded facts in this direction alone, not to mention those pertaining to nervous diseases in their relation to insanity, that it has been truly said of mental medicine that its axis has become displaced, and that it no longer revolves around psychology.

Disorders of the nervous system are obviously the most nearly allied to insanity of all other portions of the organism. Taking up first the structural diseases of the brain and cord we find that in the majority of cases some mental impairment is usually present, although it is so slight as to escape the unpractised eye until the destruction or inflammatory process has become extensive. The mental symptoms attending such lesions show a loss rather than a perversion of mental activity.

The absence of insanity from the clinical history of most cases of tumor of the brain, cerebral abscess, etc., is often instanced, but mental change is not so infrequent in this connection as is usually supposed. In an analysis of two hundred and sixty-four collected cases of this kind in the Dictionnaire Encyclopédique des Sciences Médicales, although

but six are complicated with actual insanity, eighty-five show intellectual disturbance of some kind.

Cerebral apoplexy shows the connection between the mind and the brain, in that it frequently has a sequel of mental impairment. This may be nothing more than unusual loquacity, emotional instability, slight lapses of memory, irritability, want of readiness in expressing thoughts, but careful observation will disclose a change. In those rarer cases in which the disturbance exceeds moderate bounds and becomes what is known as paralytic insanity or organic dementia (in which category come also mental disturbances following softenings, tumors, atrophies and chronic degenerations of the brain), the mental symptoms are chiefly those of marked enfeeblement, viz.: decided loss of memory, frequent crying spells without cause, inability to understand what is said, inattention to calls of nature, together with more or less helplessness. Excitement, violence and destructiveness due to hallucinations and delusions, less frequently appear and make aslyum care necessary.

Now, the value of a due observance of the mental symptoms following cerebral apoplexies lies in the possibility of assisting the process of repair by measures directed toward mental rest. Visits of solicitous friends soon after an attack or the premature return of the patient to business are surely to be avoided in the light of the above possibilities. At all events it is certainly wise for the physician to inculcate extra consideration on the part of the family toward a patient in these circumstances, even when he has recovered from the immediate effects of the "stroke." If by the employment of electricity we seek to hasten the use of the hemiplegic limb, should we not endeavor at the same time, by a judicious regulation of the patient's immediate surroundings, to meet the requirements of his altered mental state, and to secure to the patient by so doing a more prompt and permanent

return of mental capacity and vigor? In other words, is it wise in such diseases to attend solely to motor symptoms, and to allow the mental condition to take care of itself?

Cerebral Syphilis.—The facts concerning the relation of cerebral syphilis to insanity which have the most support are those which find in it the cause of a large number of cases of general paralysis. This disease is thought to be frequently dependent on syphilitic disease, and there is better evidence to support this view than that which traces a connection between it and insanity of any other form. Still, some of the best authorities acknowledge that they cannot distinguish syphilitic general paralysis from non-syphilitic general paralysis, except by the history of infection; the symptoms, course and pathological changes being the same, and anti-syphilitic treatment often failing to have any effect whatever.

The connection between cerebral syphilis and ordinary non-paretic insanity is still more difficult to trace. Dr. Sankey, one of the foremost English alienists, observes that when mental disease arises in one with syphilitic taint, it obeys the same laws in its evolution as other cases. The mental disease may be either ordinary insanity or general paralysis, and perhaps more frequently the latter. Dr. Hughlings Jackson says, "The syphilitic affections of the nervous system are very indirectly of nervous origin. Such names as syphilitic epilepsy, syphilitic insanity, though convenient, are not scientifically accurate terms. There is nothing in any kind of nervous symptom which enables us to diagnose syphilitic disease of the nervous system. The pathological processes by which syphilis causes nervous symptoms simply imitate non-syphilitic morbid processes."

These facts are cited to be set against a not uncommon tendency to suppose all insanity syphilitic which occurs in syphilitic subjects, and to suggest a guarded opinion as to such a cause in the light of the preceding observations, not

to speak of the extreme rarity of cerebral syphilis, and the comparative infrequency of insanity caused even indirectly by syphilis.

Locomotor Ataxia or Tabes Spinalis.—This, the most prominent structural affection of the spinal cord, has mental complications of various kinds. In the first place, mental enfeeblement, slight change in disposition, general sadness, loss of interest in family and business, emotional changes, and perhaps suicidal ideas, are known to be not uncommon in the initial stage of this disease; and we generally find the mental faculties weakened toward the end. But these symptoms do not amount to actual insanity.

The relation of general paralysis of the insane to true locomotor ataxia is an intimate one, and due, it is thought, to an actual propagation to the brain of the changes in the cord. The cases of this kind which I have seen in asylums had been transferred from general hospitals, and manifested extreme loss of mental power with convulsive seizures and imperfect articulation, symptoms which had supervened during the last stages of tabes. They certainly bore a striking resemblance to cases of advanced general paralysis of the insane. Numerous cases of this sort are recorded. It is true that the sclerosis of the posterior columns of the cord does not, as a rule, extend beyond the bulb; but according to Althaus, although there may be no change whatever in the brain in cases of tabes, when that disease ultimately becomes complicated with epilepsy, general paralysis of the insane and other analogous conditions, diffuse changes of the cortex and the pia mater of the brain have been discovered.

Again, cases are recorded by Savage, in which typical locomotor ataxia preceded; in which it developed with; and, finally, cases in which it appeared throughout the course of, general paralysis.

There is still another class of cases of tabes associated with ordinary non-paretic insanity. These usually take the form

of melancholia, with delusions of persecution and various hallucinations, depending probably on lesions of the optic, auditory or other sensory nerves.

Disseminated Spinal Sclerosis.—It is not generally known that besides the dementia or general weakening of the mental faculties commonly supervening in the latter stages of this disorder and of paralysis agitans, these diseases may also be a cause of other forms of insanity, and it has been believed, in the same manner as locomotor ataxia, viz.: by extension of the morbid process from the cord to the brain. This is, however, somewhat a matter of conjecture; at all events, true insanity is occasionally met with in patients suffering from disseminated sclerosis and paralysis agitans. It may present itself in various forms, but mental depression is the most prominent feature. The brain lesions, considered by some authorities to be the origin of this mental disturbance in disseminated spinal sclerosis, are isolated patches of diseased tissue, springing from the same cause as the chief disorder in the cord.

Enough has now been said to show that mental complication in structural disease of the nervous system is a somewhat frequent occurrence, and that it usually takes the form of dementia or a loss of mental power, limited function in other words, resulting from organic change with incomplete repair.

Functional nervous disorders, i. e. the convulsive and other neuroses without discovered anatomical lesions, are, as will be shown, far more often accompanied by mental symptoms than are the structural nervous affections. Moreover when the mental phenomena of this kind of nervous disorder pass the limits of sanity, they do not follow the same lines as when they are due to coarse lesions. For in the former, instead of mental inaction we find increased but perverted mental activity, and the emotions, the intellect, the will, one or all, may be involved. Witness the

delusions of the epileptic, which may follow or precede the convulsions and the instability and impulses of the hysterical patient.

The only exception to this rule is the hebetude arising from and increasing with repeated attacks of epilepsy. But this is not the immediate manifestation of the disease, which is shown in the convulsions and the mental states directly accompanying them, while, on the other hand, the mental dulness referred to is a final result of the excessive functional disturbance in the brain. It is in fact quite probably based upon minute structural degeneration, as the only lesions which can fairly be called peculiar to epilepsy are certain histological ones, which are thought by competent observers to be the effect of the repeated passive congestions to which the brain has been exposed.

Epilepsy.—Of the greater neuroses, epilepsy may be said to lie at the threshold of mental disease, so intimate is its relation to insanity. The different manifestations of this relationship are too well known and too numerous to require more than their mere enumeration. In the first place, the irregularity of the mental state of the non-insane epileptic is noticeable. In many it is a perfectly natural one, but more often the whole disposition is colored by conduct peculiar to the diseased state, and either an unusual irritability or an extreme and obsequious amiability is noticeable. Its remoter alliance to insanity is shown by the fact that many epileptics have insane parents; its close connection by the excitement with delusions or hallucinations which sometimes precede the fit, giving rise to the intellectual aura or oftener following it in various aspects, of which homicidal furor is the most significant one; again, by mental disturbance replacing the convulsions. Its possible mental states comprise mania with or without a continuance of the unconsciousness which is pathognomonic of the fit, melancholia or dementia.

These are the common and best known features of epilepsy in its relation to insanity; but the fact that seizures in no way differing from those of "genuine epilepsy" may and do frequently occur as a symptom of general paralysis of the insane is apt to be overlooked. It is not an uncommon experience with the asylum physician to receive cases of general paralysis which have long passed for epileptics, owing to a more or less accurate resemblance of the "congestive attacks" of general paralysis to the ordinary epileptic convulsions. Moreover, the fact that these attacks frequently occur in the initial stages of general paralysis is a matter which renders an accurate judgment of great importance, owing to the widely different prognosis in the two diseases and the danger to persons and property involved, in stamping an incipient paretic a harmless epileptic.

If, therefore, a patient be found to have had a fit for the first time in mature life, no matter how closely it may resemble that of ordinary epilepsy, one should never neglect to consider the possibility of having to deal with a case of general paralysis of the insane.

Hysteria, also, is generally known to be a not uncommon associate of insanity in neuropathic families, the common bond between the two disorders being enfeeblement of the will. A family I have in mind affords a good example of this association, one member being sane, but manifesting an undue emotional instability, impulsiveness, etc., and another actual hysterical mania, while a third developed melancholia with delusions.

This relationship of insanity to hysteria by heredity, by the way, would seem to favor the views recently advanced as to the probable cerebral origin of many cases classed under the heads of spinal concussion, spinal irritation, railway spine, etc., cases now recognized as hysterical, or, as some prefer to style them, cases of functional nervous disorder. For the most experienced observers claim, with Sir

James Paget, that in these cases we shall find some evidence either of mental disorder in the previous history of the patient himself, or that he comes of a stock in which mental or emotional disturbances or peculiarities, not necessarily amounting to insanity, have been recognized as prominent in the family record.

The mental phases of ordinary hysteria, viz., craving attention and sympathy, alternate outbursts of crying or laughter, the spirit of contradiction, of complaint and tendency to duplicity, as well as impulsiveness, extreme and easily excited anger and enthusiasm, are well known. In these states, which also take on redoubled intensity at the menstrual period, and together with hemianæsthesia, etc., convulsions, etc., make up the disease as ordinarily manifested, the proportion between the mental and the motor symptoms is subject to considerable variation.

These psychological disturbances lie on this side of the line which separates reason from madness. But when the mental symptoms strongly predominate, insanity may appear in the patient subject to hysteria in several ways. First, as attacks of acute mania with noisiness, excitement, loquacity, refusal of food and sexual and uterine symptoms. These may occur in place of, during or after an hysterical convulsion, and may resemble the delirium of acute disease. Another form of mental aberration may show itself as an exaggeration of the impulsiveness born of a weak will. When their impulses become irresistible, these patients may commit purposeless theft, more rarely suicide, or they may make specious accusations of the foulest crimes against innocent people. Still another form of insanity may be developed from hysteria by delusional ideas attended by hallucinations of sight and hearing growing slowly out of the natural eccentricities of the hysterical character. Again there are cases in young people closely resembling what is known as moral insanity. In the latter, with a family his-

tory of insanity and perhaps a previous attack in the patient, there is a perversion of the moral powers, utterly incorrigible conduct and constant unreliability, together with entire absence of delusions, all springing from the same childishness, frivolity and lack of self-control which are characteristic of the hysteric. Such cases are to be excluded, however, by the absence from their history of convulsive and other features, motor and sensory, of the latter disease.

Although, as has been shown, a moderate proportion of patients suffering from hysteria may develope insanity, such a result cannot be considered frequent, and a contrary opinion is likely to lead to mistakes in treatment. Cases not infrequently come under the notice of the alienist in which the early symptoms having been considered as "hysterical," the precautions necessary to be taken where insanity is indicated have been neglected. This has perhaps led to the actual detriment of the patient, harm to the family and needless anxiety and expense. When, therefore, an altered disposition appears somewhat suddenly in a patient in the form of waywardness, emotional changes, apparent shamming, lack of control, and disregard of proprieties, a careful inquiry directed to the possibility of our having to deal with the prodromata of insanity should be made. For although such symptoms are prominent in hysteria, it is inaccurate and possibly harmful in the absence of any history of motor or sensory complications, to consider and treat the disorder as hysteria. We do not always bear in mind, that states of defective inhibition are common to both hysteria and insanity.

Hypochondriasis.—Hypochondriacal symptoms are frequent precursors of attacks of melancholia and but seldom of mania. By their occasional prominence among the countless phenomena of hysteria one is sometimes at a loss to know whether he is dealing with that disease or with hypochondriasis, but here the distinction is chiefly one of terms.

The *disease* hypochondriasis, however, is to a great extent a distinct one, its essence being morbid sensations. It may properly be regarded in its relation to insanity as a rudimentary melancholia. While hysteria may be greatly relieved or cured, actual hypochondriasis is seldom greatly benefited. Hysteria again is a disease of the relatively young, while hypochondriasis belongs with advanced years as a rule. Hypochondriasis also is very near to insanity by inheritance far more so than hysteria. It has been classed by Dubois, Fenchtersleben, Savage and others as a species of insanity itself, although the usual and best known view is that a distinction should be made between two conditions, viz., sane hypochondriasis and hypochondriacal melancholia. The former is chiefly confined to absurd fancies by the patient as to various ailments, beliefs which do not influence his conduct, while the latter is characterized by marked depression with actual delusions regarding himself, such as transformation, decay or obstruction, etc., in some organ or organs, all of which are a perpetual source of misery to himself and annoyance to others, and render him greatly out of harmony with his surroundings.

Chorea.—I have stated elsewhere[1] the various conditions influencing the amount of mental disturbance which is present to some extent in all cases of chorea, but I cannot forbear repeating a caution which subsequent experience has emphasized :—

> "Although many of the ordinary cases of chorea are attended at some stage by mental phenomena, the motor symptoms so far predominate as to completely mask them. On the other hand, in the most severe cases the mental disturbance, which is often quite pronounced, being intensified by the energetic character of the movements, is apt to mislead the practitioner, who considers the patient simply insane, and sends him to an asylum. Whereas, if the case had been recognized at the start to be one of chorea he would hesitate to do so. The case just reported is an extreme example of this mistake and more may be found in asylum records."

[1] Notes on a Case of Chorea. etc., Boston Med. and Surg. Jour., Jan. 5, 1883, p. 76.

Within a year following the date of this statement three cases of acute chorea in adults were admitted to the Danvers Lunatic Hospital, under the same circumstances. Should a case of this kind in a patient who could command better facilities at home be committed to an asylum under like circumstances through a mistaken view of his trouble, it might be a serious matter to all concerned.

Delirium Tremens.—Some of the relations of delirium tremens to insanity have a practical value to all practitioners, and will bear restating. I refer to the gradual prolongation of the delirium into acute alcoholic insanity, a result not uncommon in neurotic subjects. In such persons a much smaller amount of liquor is known to prove excessive and to produce delirium tremens. Such patients are also more likely to have an attack of mania engrafted on that of the delirium. When a case of delirium tremens does not recover in the usual time, but the patient remains apprehensive, suspicious, and it may be excited, having also pronounced delusions of persecution, etc., it is by no means necessary to send the patient, if a person of means, to an asylum. The attack of mania is usually short and the prognosis almost wholly favorable. Some of these cases of prolonged delirium tremens are also exceedingly like cases of general paralysis of the insane in the first stage. I have a case in mind where the diagnosis was for weeks impossible, although the patient was under close observation in an asylum. Tremor of the facial muscles and tongue, unequal pupils and impaired articulation were present, together with exaltation, ideas of grandeur, disconnected talk, etc. As a rule, active maniacal symptoms developing from delirium tremens do not eventuate in the pure insanity ordinarily manifested, nor in maniacal cases of this variety is a repetition of the attack probable unless the same cause be present.

Having considered cases of structural and functional nervous disorder in the relations indicated, I pass now to a

form of disease which embraces both of the foregoing, viz., *General Paralysis of the Insane*. The claims of this disease to a place among nervous disorder are acknowledged, but their force is not always appreciated. As its mental phenomena embrace all the usual forms of insanity, so also are its motor and sensory symptoms most comprehensive. This is true, not only as regards similarity in the symptoms, but also in the underlying anatomical lesions of individual nervous disorders. One who is at all familiar with this affection needs only to run over the list of nervous diseases to be satisfied of this. In short, a collection of cases of general paralysis may illustrate pathologically and clinically at some stage, almost any of the disorders of the cerebro-spinal system, structural or functional.

That there is a fundamental difference also between insanity proper and general paralysis seems now to be put beyond question by recent investigations by Professors Ball and Regis, extending over a number of years, and based upon the vital statistics of the families of 318 general paralytics. From these it appears that the disease in question is essentially different from ordinary hereditary insanity, in arising simply from an inherited tendency to cerebral congestion or a predisposition to coarse cerebral disease. Moreover, it is found that general paralysis and ordinary insanity are not two branches of one family, and can never give rise the one to the other.

We can now, therefore, maintain with a great degree of confidence, that children of general paralytics have no predisposition to insanity, although they are particularly liable to organic diseases of the brain,—of childhood for example, —cerebral paralysis, etc. Thus we find that an accurate knowledge of the relationship of general paralysis of the insane to true insanity is of great value to the physician whose advice is asked concerning the marriage of the offspring of such patients.

It will appear, I think, from what has now been said, that a plea for closer consideration of the mental accompaniments of nervous disorders is justifiable. At the same time I do not overlook the fact that not only are neuroses with serious mental complications few, as compared with the myriad cases of nervous disease without such manifestations, but also that the association may in some instances be one of coincidence, the insanity occurring merely as an intercurrent and independent disease. But giving these facts their full value, it is nevertheless certain that annoying and perhaps disastrous mistakes may frequently be avoided by timely inquiry into the mental condition of many cases of nervous disease. Finally, it is probable that the clinical history of nervous disease in many of its forms will never be complete without a full consideration of its mental aspects.

ARTICLE XXIII.

CREMATION IN ITS SANITARY ASPECTS.

BY JOHN O. MARBLE, M.D.
OF WORCESTER.

READ JUNE 10, 1885.

CREMATION IN ITS SANITARY ASPECTS.

THE TORCH VERSUS THE SPADE.

"*Vermibus erepti puro consumimur igni.*"

WISE sanitation is now universally regarded as essential to the public welfare. The health and safety of the people is believed to depend quite as much upon preventive medicine as upon curative. The subject of this paper is, *par excellence*, one of preventive medicine. Advances in pathology and therapeutics have no more than kept pace during the past ten years with progress in sanitation, equally important and efficacious in the promotion of health and the saving of life.

The proper method of disposal of the dead is, I believe, one of the greatest, if indeed not the greatest sanitary problems of the day.

Mr. Eassie, Hon. Secretary of the Cremation Society of England, to whom I am indebted for many facts relating to this subject, said at a recent sanitary council, "I am in a position to guarantee facts, and having a lively acquaintance with the history of other sanitary reforms, I think it my duty to declare my opinion that the problem what to do with the dead, transcends in importance every other sanitary question."

The limited time at my disposal to-day forbids me to present to you more than a skeleton of this grave subject.

I shall, however, endeavor to demonstrate the dangers to the living, from the prevalent custom of earth burial,

and the hygienic advantages of cremation over the time-honored, but always and everywhere unsafe practice.

It is an unprofitable, as well an impossible, task to trace back to their origin either cremation or earth burial. Inhumation had certainly not the most honest origin if, as we are told, Cain buried his brother to conceal his crime. It is a disputed point when urn-burial was first adopted even by the Greeks. The Iliad account of the funeral rites of Patroclus and Hector is, I believe, the first mention of incineration in Greek literature. Rome in her earliest history, according to Pliny, practised earth burial, yet at that early period cremation was also a custom as stated by Ovid. During the Trojan war cremation appears to have been adopted that the remains of dead heroes might be restored to their native land. We are told that Hercules burnt the body of Argius, because thus only could he return the remains of the son to his sorrowing father.

Homer causes his dying hero, fainting at the approach of death, to say:

> "Ah, leave me not for Grecian dogs to tear!
> The common rites of sepulture bestow
> To soothe a father's and a mother's woe:
> Let their large gifts procure an urn at least
> And Hector's ashes in his country rest."

Neither is it certainly known whether incineration was originally adopted on sanitary grounds, yet it appears probable from the fact that it was generally resorted to after great battles. It is an undisputed fact, however, that in the fourth century, after Christianity became established, cremation fell into disuse, inhumation becoming thereafter the more general custom throughout Europe. Whether this was due to the fact that Christian people desired thus to distinguish themselves from the so-called heathen or pagan nations, as is claimed, or to the absurd idea that burning the body would interfere with its final resurrection, concerns us little at the present day.

The battle of the torch and spade has been waged in earnest in modern times, since the year 1873 when Prof. Brunetti, at the International Exposition in Vienna, exhibited his samples of the results of a scientific cremation. Previous to that date, skirmishers had appeared at intervals with more or less influence ever since good old Sir Thos. Browne, more than two hundred years ago, wrote his excellent paper on Hydriotophia or Urn Burial. But during the past ten years an immense number of papers upon the subject have been published in every country of Europe, and more recently in this country. With few exceptions the practice of earth burial has received the condemnation of science, the world over, and in its stead cremation has been everywhere recommended as a safe, rational, and unobjectionable custom, one which would annihilate powerful sources of disease, and greatly promote the public health.

The final disposition of the dead concerns only survivors, and its importance to posterity cannot be overestimated. When the population was scarce perhaps it mattered less, but with the increasing tendency of people to congregate, the question before us now increases in importance *pari passu* with increase of population.

The question is, what ought to be done with the dead by reasoning and intelligent men in the 19th century, with their present knowledge of sanitary science. Shall we continue to bury the corpse in the earth, blindly believing that catering to sentiment will protect us from being perhaps fatally poisoned by gases rising through the soil to pollute the air we breathe, or disseminated through it to contaminate the water we drink, or shall we, like reasonable beings, after proper funeral ceremonies over the body of our dearest friend, allow it to be reduced to ashes in an hour, and thus to leave the earth no worse for having died, if possibly for having lived, upon it?

From the moment that the heart ceases to beat, and the vital spark leaves an organized living body, as well of man as of the lowest animal, putrefaction begins its slow and loathsome process. It gradually passes through the successive phases of decomposition too horrible to witness or even to describe, except when necessary, until all the constituent elements are set free by a tedious and dangerous process of combustion. This process may last according to the nature of the soil for ten, twenty, or a hundred years. While this change is going on, every particle of matter around the festering body is being saturated and infected with germs of disease and death. In case death was caused by such disease as yellow fever, small pox, or cholera, these germs are not destroyed by inhumation, as they certainly are by incineration, but are planted as it were, to sprout again with renewed virulence whenever the soil is afterward disturbed.

So long as we live the vital forces of nature are in operation. Immediately after death, however, the retrograde metamorphosis begins, which will surely render the body, perhaps now beautiful in death, a thing of horrible aversion, and unwilling disgust.

The process of decomposition, decay and putrescence goes on with varying degrees of rapidity, according to season, temperature and moisture, till it becomes a menace to the living, however reluctantly we may admit the painful fact; and the disagreeableness of a fact is no evidence that it is not true or that we can afford to ignore it.

In a paper read by Mr. Darwin before the London Geological Society, on the "formation of mould," that eminent scientist proved that in many fields every particle of the superficial layer of earth has passed through the intestines of worms. By observations in different fields he proved that in one case a depth of more than three inches of this worm mould had been accumulated in fifteen years, and in

another, that earth worms had covered a bed of marl with their mould in eighty years to an average depth of thirteen inches. This is curiously confirmatory, says Sir Spencer Wells, of the recent conclusions of Pasteur, who, in his researches into the etiology of charbon, shows that this earth mould, brought up by worms, positively contains the specific germs which propagate the disease, and that these same organisms are found in the intestines of the worms. These parasitic organisms will resist the putrefactive process many years, and lie in a state of latent life like any flower seed or grain of corn, ready to germinate and propagate the disease.

The practical inference in favor of cremation is so evident that the most sentimental objector, however blinded by prejudice, cannot fail to see it.

It now appears well established that zymotic diseases are propagated by germs; and if the much abused Koch yet succeeds in proving the "comma bacillus" to be the *fons et origo* of cholera, there would seem to be hope of bringing that dreaded scourge to a period.

By burying in the ground a body dead of any zymotic disease, we are planting for our descendants, seed, sure, sooner or later, to bring forth a horrible crop of pestilence and death! This can no longer be doubted, or the fact ignored, for it is incontrovertibly established on the concurrent testimony of the highest scientific authority.

Dr. Freire, of Rio de Janeiro, while investigating the cause of yellow fever, found that the soil of cemeteries wherein the victims of that disease were buried, was alive with microbian organisms identical with those found in the vomit and blood of patients who had died of it in the hospital. He took samples of the earth, one foot below the surface, over the remains of a victim of yellow fever, and found them swarming with the characteristic germs. He is therefore justified in characterizing the cemeteries as the

nurseries of yellow fever, the perennial foci of that dreaded disease.

Cholera already threatens us. In case it comes, and victims, few or many, die, shall we, in view of what has just been shown, plant their festering bodies in the earth, to come forth again in myriad forms, to breed additional pestilence, if possibly not for us, yet surely for our descendants, if the grave should ever be disturbed? There can be but one answer.

As yet there is but one known, sure, and never failing germicide—fire. No disease germ, it is safe to say, has ever passed through the crematory fires and survived to propagate its species.

History literally teems with accounts of epidemics caused by animal decomposition. The hygienic dangers of inhumation, *per se*, were recognized by the ancients, and repeatedly strenuous efforts were made to abolish the custom. Just as to-day a few oppose cremation, so the heathen were disputing a like question before the advent of Christianity. Why then call it "Christian burial" to permit bodies to putrefy in the darksome grave, and so possibly, nay probably, at some future day to generate "the pestilence that walketh in darkness and the destruction that wasteth at noonday."

The cause of the death of the renowned Hannibal is familiar to readers of history. He laid siege to a city of Sicily, and wishing to build a wall of defence, tore down the old tombs to obtain material. The disturbing of so many dead bodies caused a terrible pestilence, which destroyed not only vast numbers of the Carthagenians but Hannibal himself also.

The sudden death of the vandals who broke open the coffin of Francis I., in the time of the French Revolution, to rob it of its treasures, is another familiar instance in proof of the lethal effect of the gases generated by corpses, and of their almost indefinite persistence.

The terrible scourge of cholera in London in 1854 was believed to have had its origin in the upturning of the earth in which the plague-stricken victims of the year 1665 had been buried; and the Report of the London Board of Health for 1849 states that the cholera was specially prevalent and fatal in the vicinity of grave-yards. Again, it is an established fact that the plague broke out afresh in Modena, Italy, in 1828, in consequence of excavations of the earth, where three hundred years before the victims of that disease had been buried. Do we wonder that the sanitarians of Italy are enthusiastic advocates of cremation?

But it has been claimed that instances of disease caused by water and air vitiated by graves, are mostly of ancient origin, that they occurred before intramural interments were generally prohibited. They do still occur, however, though less frequently, thanks to the efforts of sanitarians, as can readily be shown. Dr. Santa vouches for the fact that a severe epidemic of fever was caused, but a few years ago, by drinking water poisoned by grave-yard soakings in the villages of Bellita and Rotendella, Italy. More recently even the Monumental Cemetery at Milan was proved to have been the cause of severe illness in its vicinity, the wells being the channels of infection. The so-called Roman fever has usually been attributed to malaria from the Pontine marshes. No doubt they are dangerous enough and produce their share of miasm, but now come Sir Lyon Playfair and other sanitarians contending, and reasonably, that a more probable, or at least an additional cause of the peculiar fever of the Eternal City exists in its soil and that of its environs, saturated as it has been for centuries with the decaying remains of its millions of buried dead.

In our own country, the Atlanta Medical Journal recently reported the case of two young ladies, who drank water from a spring situated on a hillside near an old grave-yard, one of whom died soon after of diarrhœa and pyæmia, and

the other of typhoid fever. Cattle also drank the water and were made sick. The fact is vouched for, that whenever cholera or yellow fever has visited New York city, it has prevailed especially in the vicinity of Trinity church-yard; and two years ago this spring, that same neighborhood suffered severely from typhoid fever when it was not prevalent in other parts of the city. Washington Square, New York city, was for a long time used as a Potter's Field. In 1806 it was converted into a public square, and for years after, as the oldest physicians testify, it was almost impossible to rear children on the ground floors of houses in that vicinity.

When, a few years ago, the old disused cemetery in Mechanic St., Worcester, was removed, hundreds of loads of the superfluous gravel were spread broadcast upon our streets. I feared that disease might result and was on the watch for it. I had many cases of severe sore throat, diarrhœa and fever in that locality, which I believe were caused by poisonous emanations from that saturated soil. That the city escaped an epidemic of some pestilential disease was no doubt due to the fact that probably no one there interred had died of cholera, yellow fever or small-pox. My fears were considered unnecessary by my professional brethren at that time, but I could not reply with proof, for I was not then aware, as I now am, that a severe epidemic of fever in 1843 nearly decimated a town in England from precisely such a cause.

The monstrous delusion that the mere contact of the corpse with fresh earth renders it innocuous and suffices for safe disinfection, is dissipated by overwhelming evidence. I distinctly remember my boyish scruples concerning the water of a well situated not fifty yards from graves in the church-yard adjoining my father's garden. He overcame my fears by stating the belief then held, that the earth was a purifier and a safe depurator, and that no harm could come

to that well, thirty feet deep, the pride and unfailing source of supply of the neighborhood. Yet I that same autumn suffered a severe and nearly fatal attack of typhoid fever, and another member of the family was similarly affected a year later. The fever occurred when the well was low, and I have no doubt, in the light of present knowledge of such dangers, that, repulsive as is the thought, I drank water filtered through the bones of my revered ancestors buried there, and that the polluted water caused that illness. To those who criticise the advocates of cremation for quoting ancient examples only, of harm from graves, this instance will appear sufficiently recent and intimate.

Permit me here to quote the opinions of a few men who have expressed themselves emphatically upon the evils of inhumation, and whose deliberate judgment carries conviction with it.

Dr. Parkes, one of the highest authorities in the world on hygienic subjects, declares that it is a matter of notoriety that the vicinity of graveyards is unhealthy.

Sir Henry Thompson writes, "No dead body can be left in the ground without poisoning the earth, the air and the water above and about it. Within a few weeks the decomposing corpse is pervaded with bacteria or microbian organisms, which together with the gases generated in the putrefactive process are struggling with each other in foul *melée*, each seeking to escape from its loathsome imprisonment."

Dr. Curtis, of Chicago, writing upon the evils of earth burial says, "that the dead do kill the living is only too true, and that cholera and the whole list of zymotic and infectious diseases are transmitted through the contamination of air and water supplies, is no more difficult of demonstration than it is to prove the ability of sewer gas or sewage water to propagate disease. The proximity of burial grounds to disease-infected localities is not to be explained on the theory of coincidence."

Mr. Cooper, in his work on "The Causes of Epidemics," states that the digging up of the so-called plague burying grounds in Derbyshire, England, caused an immediate outbreak of that disease, and he argues strongly that burial in the earth is always and everywhere dangerous to the living.

The French Academy of Medicine reports that the putrid emanations from Père la Chaise, Montmartre, and Montparnasse, have caused frightful diseases of the throat, fevers, and diarrhœa, to which numbers fall victims every year, and that these fatal diseases have been traced to vitiated air and water, and rage with greatest violence near cemeteries.

So great a thinker as the Earl of Beaconsfield, whose knowledge was confined to no one science, and who was ahead of his times in more respects than one, said in the House of Lords, in 1880, "what is called God's acre is not adapted to the times in which we live nor to the spirit of the age. The grave-yard is an institution very prejudicial to public health, and the health of the people ought to be one of the first considerations of a statesman. The time has arrived when a safer method of disposal of the dead should be instituted." Jew or Christian, the sentiment is creditable to the memory of Disraeli.

The distinguished bishop of Manchester, referring to the consecration of a cemetery, said in the same year, "I feel convinced that very soon we shall have to face the problem how to bury our dead out of sight with safety to the living. I hold that the earth was made for the living, not for the dead. No intelligent faith can suppose that any Christian doctrine can be affected by the manner in which, or the time in which, this mortal body crumbles into dust and sees corruption. The question must be met, for cemeteries are becoming not only a difficulty and a great expense but an actual danger."

The general consensus of opinion of sanitarians the world over, adverse to earth burial, is the surest proof that the

practice is dangerous to survivors. It would almost seem that Shakspeare was inspired by a prophetic sanitary wisdom when he referred to

> "The very witching time of night,
> When graveyards yawn, and hell itself breathes out
> Contagion on this world."

All the horrible results and disgusting details of poisoning from the buried dead are admitted, but it is claimed by some that they occurred in the days of intra-mural interments, and that abolishing that custom terminated the danger. Nothing could be more false. Removing cemeteries to a distance only postpones the evil, and, while safer for us, entails upon those who come after us a legacy of pollution, disease germs and death, with which they will justly reproach us, and which we ought to be wise enough to prevent while we have the power. The very men who claim that earth burial is safe and that graveyards are harmless when removed to a distance, go on to recommend different methods of averting the very dangers which they claim do not exist. One advises planting groves of trees to absorb the deleterious gases, apparently aware that it is only the absorbent power of vegetation which renders the air over cemeteries at all tolerable. Another would leave them bare that the winds of heaven may sweep over them with purifying influence. Have they forgotten that in most growing cities and towns the present suburbs will soon be built over, and that the sanitary precautions recommended in connection with burial in the earth are seldom, if ever, fully taken? Such inconsistency is inexcusable, since the weight of evidence, especially during the past ten years, shows that inhumation of dead bodies is always and everywhere perilous. To postpone or ignore the danger (excusable, perhaps, in bachelors), is unworthy of fathers of children, for the fact that the future will some day be the present makes it the object of solicitude to all unselfish humanitarians today.

The greatest evil result of inhumation of the dead is undoubtedly the contamination of water.

> "The rivers die into offensive pools,
> And, charged with putrid verdure, breathe a gross
> And mortal nuisance into all the air."

It was, I believe, the oft-quoted Hippocrates who first formulated the requisites of health, as "pure water, pure air, and a pure soil"; and in our day the most eminent physicians maintain that polluted drinking water is by far the most frequent cause of enteric fever and other zymotic diseases; and when we consider that three-fourths of the human body and nearly as great a proportion of all our daily food consists of water, the importance of its purity is at once realized. Yet but a few years ago when Woodworth sang,

> "How sweet from the *green mossy* brim to receive it,
> The *moss-covered* bucket which hung in the well,"

the poetry was applauded, and the danger unseen. Temperance reformers complain of slow progress against the ravages of alcohol. Water has also its victims, I had almost said as many, and a part of their energies might profitably be directed to a crusade against its contamination by cesspools, drains, and cemeteries. Drains as well as drams are dangerous.

A well-recognized and, as I believe, not uncommon cause of typhoid fever is impure milk. The water for dairies appears to be of more importance than the supply of food (and I have no reference to the cupidity of the average milkman). I have personal knowledge of cases of enteric fever believed to have had their origin in milk produced by cows pastured near an old cemetery, the water which they drank being supplied by springs very near it. Thus even milk may not always be a safe beverage. The fabled founders of Rome have been considered wise in their choice of a sanitary source of supply; but even that galactophorous wolf may possibly not always have drunk from the same

babbling stream with the storied lamb, but from some Roman pool of doubtful purity.

In view of what has already been shown, I venture to assert that earth burial is only an evil, and that continually. No spot of ground accessible and convenient for present use as a cemetery can be found, which will not, in the future, be liable to be needed and used as the residence of man; and the indefinite persistence of graveyard pollution has been, I hope, abundantly proved.

An old well on the old common in Worcester, which was formerly used as a cemetery, has recently been shown to be contaminated by the products of animal decomposition, no other source than the old graves being evident or probable.

Prof. Pumpilly has ascertained by recent experiments that sandy soil interposes absolutely no barrier between wells and the bacterial infection from cemeteries and cesspools lying even at a considerable distance from them. Indeed he claims further, that "dry gravel and coarse sand do not prevent the entrance into houses built upon them, of those micro-organisms which swarm in the ground air, around leaky cesspools, near graveyards, and in the filthy made land of cities." Not even the filters employed in the laboratories have been quite effectual in preventing the passage of those many named microbes which are now recognized as the cause of the transmission of disease.

So well recognized is the fact of the danger of the poisoning of water by graves that laws exist in France prohibiting the opening of wells within one hundred yards of any place of burial; and in some of the German states it is forbidden by law to dig wells nearer than three hundred yards to any grave; and at a hygienic council, held some time ago in Brussels, it was decided that the safe protective distance should not be less than four hundred yards. In our country I am not aware that any such laws exist. In Philadelphia, three cemeteries estimated to contain 80,000 graves are so

situated as to be liable to drain into the Schuylkill, above Fairmount dam, whence is drawn the city's water supply. The "Centennial diarrhœa," so called, had a cause other than exhaustion from too much sight seeing. Many eminent sanitarians now believe that cause was graveyard pollution of water, drunk by strangers unaccustomed to it.

It may appear that the title of this paper should have been more appropriately "the dangers of earth burial," but I may reply that in demonstrating such universal and inevitable dangers, not only at present but for posterity, I have proved the urgent necessity for cremation, for, so far as is yet known, all other proposed or practised methods of disposal of the dead are defective and impracticable, in our country at least. They have little to recommend them anywhere. "Exposure," practised by the Parsees and other tribes of India, the body being left where it can be devoured by wild beasts or torn by birds of prey, seems cruel and barbarous, and is not even desirable in a sanitary view, for I am told by my friend Dr. Peabody, of Worcester, who has lived in Bombay, that the vultures frequently dropped large masses of flesh where they became offensive to the inhabitants. We are hardly ready to erect "towers of silence" or to suspend our dead upon the limbs of trees to be disposed of in such a manner. The Hindoos expose their dead upon the banks of their sacred river, to be the prey of their river monsters. Burial at sea is only one form of exposure, for marine animals soon devour the corpse.

Embalming, mummifying, or desiccating, as practised by the Egyptians for ages, is disgusting, imperfect and unsatisfactory. Such effort to preserve the body is always only partial, the resulting object being horrible, ghastly and distressing to behold. The sight of such of these ancient relics as I have encountered in the Smithsonian Institution at Washington, in the Museum of the Royal College of Surgeons in London, and elsewhere, is quite enough to disenchant

any one who might aspire to have his dead body set up in that odoriferous and obsolete style.

Various other methods of rendering the corpse harmless have been proposed. One believes it possible to destroy all living germs in a dead body by injecting the blood-vessels with chemical reagents known to be deadly to these organisms. He suggests one of the soluble salts of mercury as the most deadly of protoplasmic poisons. Another suggests covering the uncoffined body in the grave with quick lime to hasten the process of decomposition; but it is difficult to see how this would be any less revolting to the feelings of friends than is cremation by the present scientific and decorous method. The ancient form of cremation or fire burial, the "feüer bestattung" of the ancient Germans, and the funeral pyre of which so much is written in the classics, was disgusting and open to many of the objections now urged against earth burial. The corpse placed upon a pile of wood, the "pyra" gave forth the most nauseating smells, to counteract which expensive gums and essences were consumed with it in extravagant quantities, while with rich flames and hired tears they solemnized their obsequies.

Modern cremation is stripped of all these objectionable features. The body is totally consumed in an hour, or two at most, leaving only a few pounds of harmless residuum, and all without the least odor or offence to the most fastidious sense.

The problem is, given a dead body, sure in a few days to become dangerous to the living, how shall we dispose of it reverently and with absolute safety to survivors, both now and hereafter forever. The answer is by fire, all-purifying fire, the element which when uncontrolled is no doubt the ruthless and destroying enemy of man, but when under control is his servant and friend. Indeed "the ethereal fire has been the most sacred symbol in nearly every varying faith of the world of the visible presence of God." The followers

of Zoroaster are not the only worshippers of the Sun. There are "Fire Worshippers" in our day, and their number increases as the sanitary value of fire becomes known. Fire will destroy absolutely every form of disease germ, while no degree of freezing will do so. Pork may be exposed through an arctic winter, then thawed and found to propagate the trichinous disease. Cold does not destroy animalculæ, for they abound in ice water. Heat will utterly destroy the cryptogamic spore and annihilate the mycelium, but freezing only affords them a temporary rest. All other disinfectants are feeble and ineffectual when compared with the all-purifying fire. Indeed many devastating conflagrations which in cities have been deplored as calamities have really been blessings in disguise as disinfectants and promoters of health. The great fire of London, as is well known, terminated the plague and purified that pestilential city. The ancient rabbis tell us that in times of pestilence, fires were kept burning in the valley of Tophet to consume the dead and to disinfect the air.

Scientific apparatus has now been devised capable of reducing a human body to ashes safely, quickly, and not unpleasantly. There is offered to the people a custom which will forever annihilate the dangers set forth in this essay, the contamination of earth, air and water, the liability to burial alive, the sacrilegious work of grave robbers, and much of the unnecessary expense of funerals.

Reason everywhere approves the reform, and sentiment alone opposes it. Sentiment is always to be regarded when the safety of the people is not jeopardized thereby. Otherwise it is our duty to strive to substitute for exuberance of sentiment, persuasive reason.

Let us then boldly advocate this reform, for whatever opposition we meet to-day, there can be no doubt of the favorable verdict of posterity upon our action.

That cremation has won its way so slowly until within

the past ten years, only proves again how slow and difficult it ever is to stem the tide of popular prejudice and institute measures of any sanitary reform. Recently, however, the recognition of its merits has imparted to its advocacy a new impetus in all civilized countries, and while I would not mistake the crowing of the cock for the rising of the sun, I may predict that this greatest of sanitary reforms is destined to prevail in the near future.

A Fellow of this Society contributed to the Report of our State Board of Health, for the year 1875, an able paper upon "Cremation and Burial." He arrived at the conclusion that incineration of the dead was not then a sanitary necessity. This opinion was based largely upon the negative testimony of a large number of physicians in this State, who had not probably given much attention to the subject. A decade of sanitary investigation having passed, the dangers of interment having become more evident, and the scientific process of cremation having become perfected, I doubt if he would now arrive at the same conclusion after a similar amount of research.

The only objection to cremation, founded in reason and not sentiment, is, that the practice might destroy evidence of crime. Lack of time forbids me to answer this objection *in extenso*. I may say, however, that Lucrecia Borgias are extremely rare in our day, and that even if cases of criminal poisoning and other crimes against life and health were far more common than they now are, instances of disease and death, due to the evil effects of inhumation, are believed to outnumber, by far, cases of undetected crime which could possibly be due to the adoption of incineration; and, on the principle of the greatest good to the greatest number even, the proposed reform would still be justified.

Though the sanitary is the chief argument in favor of cremation, there are other important reasons for its adoption. The genus "Jerry Cruncher" is not extinct. Remember

that the remains of your dearest friend are never secure from the unholy rapacity of the grave robber. It seems almost a pity to disturb the illusive dream that cemeteries are sleeping places of the dead, as the name implies, yet it is a pathetic fact that neither the body of the pauper, buried without a tear, that of the millionaire committed to the vault with more than royal magnificence, nor even that of a martyred president, placed in the tomb protected by bolts and bars, is safe from the sacrilegious hand of the resurrectionist. "Body snatching" is shockingly common.

Again the danger of *burial alive* is not wholly chimerical. A work recently published in Italy reports sixty-five authenticated cases of burial of persons afterwards discovered to have been alive at the time. In this country we often read of persons being resuscitated from what appeared to be the sleep of death. Cremation being the practice, this inexpressibly horrible calamity would be impossible, and if by any accident a body not already dead were to be placed in the crematory furnace, death would be instantaneous and painless.

Again, should cremation become general, the *expense* of the proper and decent disposal of our dead could be greatly reduced. True, the poor as well as the rich could still, if so disposed, waste their means, or those of their friends, on splendid coffins richly palled, stately hearses adorned with gaudy plumes, gaily caparisoned horses, and all the superfluous paraphernalia of worldly woe, for

> "The world hath bubbles, as the water has,
> And these are of them";

but these trappings are not necessary, and when our work on earth is done, we need not cause our friends, overwhelmed perchance by grief, to be also weighed down by debt in order to dispose of our mortal remains respectably. A showy funeral is a hollow mockery, a relic of barbarism. Pride and ostentation in the presence of the great destroyer, are

painfully inappropriate. Simplicity, quiet, and decorum should here prevail. Instead we see extravagance, a noisy brass band, feathers, and plumes. With cremation a part at least of this Vanity Fair could be abolished. A strange and holy mystery is death, and Christian people should be able to devise more modest methods of disposal for its silent victims.

However unpleasant the choice of evils, no sanitarian can hesitate between Ustrina and Golgotha. "The place of a burning" or "the place of a skull" is, so far as is yet demonstrated, the inevitable alternative.

"Instead, therefore, of thrusting our loved ones who have departed this life into the gloomy grave, there to fester in loathsome putrefaction, and thence to come forth in ghastly forms of dreaded disease, let us reverently, decorously, and expeditiously translate them by means of the all-purifying fire into the elements of all new and beauteous life. So shall our fair land become indeed, as it should be, the land of the living, and not the valley of the shadow of death."

APPENDIX.

THE MASSACHUSETTS LAW REGARDING CREMATION.

AN ACT authorizing the formation of Corporations for the purpose of Cremating the Bodies of the Dead.

Be it enacted, etc., as follows:

SECT. 1. Any five or more persons may associate themselves together in the manner prescribed by chapter one hundred and six of the Public Statutes, *with a capital of not less than six thousand, or more than fifty thousand dollars*, for the purpose of providing the necessary appliances and facilities for the proper disposal by incineration of the bodies

of the dead; and corporations so established shall have the same powers and privileges and be subject to the same duties, liabilities and restrictions as other corporations established under said chapter, except as hereinafter provided. The *par value of shares* in the capital stock of corporations organized under the provisions of this act shall be *either ten or fifty dollars.*

SECT. 2. Every such corporation may acquire by gift, devise or purchase, and hold in fee simple so much real estate not exceeding in value fifty thousand dollars, as may be necessary for carrying out the objects connected with and appropriate to the purposes of said corporation, and situated in such place as the state board of health, lunacy and charity may determine to be suitable for said objects and purposes. No building shall be erected, occupied or used by such corporation until the location and plans thereof, with all details of construction, have been submitted to and approved by said board or some person designated by it to examine them.

SECT. 3. Every such corporation may make by-laws and regulations consistent with law and subject to the approval of said state board, for the reception and cremation of bodies of deceased persons, and for the disposition of the ashes remaining therefrom, and shall carry on all its business in accordance with such regulations as said board shall from time to time establish and furnish in writing to the clerk of the corporation, and for each violation of said regulations it shall forfeit not less than twenty nor more than five hundred dollars.

SECT. 4. No body of a deceased person shall be cremated within forty-eight hours after decease, unless death was occasioned by contagious or infectious disease; and no body shall be received or cremated by said corporation until its officers have received the certificate or burial permit required by law before burial, together with a certificate from the medical examiner of the district within which the death occurred, that he has viewed the body and made personal inquiry into the cause and manner of death, and is of opinion that no further examination nor judicial inquiry concerning the same is necessary. For such view, inquiry and certificate he shall receive the fees prescribed by section nine of chapter twenty-six of the Public Statutes for a view without an autopsy by examiners in counties other than Suffolk County. Medical examiners within their respective districts shall make such view and inquiry upon application therefor and payment or tender of said fees.

SECT. 5. This act shall take effect upon its passage.

Approved May 26, 1885.

ARTICLE XXIV.

CONSANGUINEOUS MARRIAGES: THEIR EFFECT UPON OFFSPRING.

By CHARLES F. WITHINGTON, M.D.
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READ JUNE 9, 1885.

CONSANGUINEOUS MARRIAGES: THEIR EFFECT UPON OFFSPRING.

THE subject of this paper is of interest alike to the physiologist and to the practitioner of medicine, who is constantly liable to be called upon for his opinion as to the desirability, or more often as to the safety, of prospective marriages between relations. The great practical importance of correct views upon this matter has seemed to me, therefore, to justify still further investigation of a topic on which, although much has been said, little has been settled.

The traditional belief, held still by a large majority of the laity and by very many of the medical profession, has been given physiological expression by no one with greater clearness than by Dr. Devay. He says[1]:

"The objection to consanguineous marriages in not * * * the perpetuation in families by means of inter-marriages of maladies susceptible of hereditary transmission, as certain forms of temperament, certain organic predispositions, like narrowness of the chest or other vices of formation. *It is evident that the condition of consanguinity in itself adds nothing to the chances of morbid inheritance* which, depending upon the health of those marrying and of their respective ancestors, have the same source in every sort of marriage. We charge upon unions between relatives of the same stock, the production, by the *sole fact of non-renewal of the blood* (*non renouvellement de sang*), of a specific

[1] Hygiène de Famille, 2d ed., p. 246.

cause of organic degeneration fatal to the propagation of the species."

Now this statement is very explicit, to the effect that besides the ordinary laws of inheritance which may affect offspring for good or for bad, there is in marriages of relations a specific degenerative influence, due to the mere fact of "non-renewal of the blood." If this be true, it follows that the operation of this influence will be equally potent and baneful when the persons united are healthy as when they are diseased. And there should be discoverable among the offspring of such unions a conspicuous deterioration, out of all proportion to those other hereditary influences whose potency is so well established. Indeed it is difficult to see why, if this supposition be true, we should not find some evidence of degeneration present as the rule in all the persons born from marriages of relations, inasmuch as in all these cases by the hypothesis this specific cause of degeneration is present. Whether this is the fact, has been made the subject of inquiry by many investigators, but with results so utterly diverse as to leave the student more bewildered than ever, and to suggest that in no field of investigation has the statistical method more pronounced limitations than in this. In a paper like the present we can only allude in the briefest manner to some of the most important collection of cases illustrating the opposite views on this question.

Dr. Bemiss[1] collected thirty-four cases of consanguineous marriages. Seven, or 20.5 per cent. were barren. One hundred and ninety-one children were born; an average of 5.6 children per marriage, barren and fertile. Of the one hundred and ninety-one children, fifty-eight died young; fifteen of them from consumption. Of the surviving one hundred and thirty-four, thirty-two are said to be "deteriorated, but without absolute indications of disease." A large number of diseases and defects are ascribed to forty-seven

[1] N. A. Med. Chirurgical Review, January, 1857.

of the remainder, and only forty-six are described as healthy.

Dr. Bemiss also made a report to the American Medical Association[1] the following year, in which he collected eight hundred and thirty-three consanguineous marriages, producing three thousand nine hundred and forty-two children, being 4.6 children per marriage. 28.7 per cent. are put down as defective, 3.6 per cent. as deaf mutes, 2.1 per cent. as blind, 7 per cent. as idiots, 2.04 per cent. as insane, 1.5 per cent. as epileptic, 7.6 per cent. as scrofulous, and 2.4 per cent. as deformed; 22.4 per cent. are recorded as having "died young."

Dr. Howe[2] collected in the same year, from statistical tables in Massachusetts, seventeen cases of marriage of kindred. "Most of the parents were intemperate or scrofulous; some were both one and the other." These unions produced ninety-five children, of which forty-four (nearly 50 per cent.) were idiots, twelve were scrofulous or puny, one deaf and one a dwarf.

Dr. Arthur Mitchell,[3] Deputy Commissioner in Lunacy for Scotland, found among one hundred and forty-six children born from forty-five consanguineous marriages (thirty-seven of them being fertile), 5.5 per cent. idiots, 3.4 per cent. imbecile, 7.5 per cent. insane, 1.4 per cent. epileptic, 3.0 per cent. paralytic, 1.4 per cent. deaf mutes, 2 per cent. blind, 15 per cent. "consumptive, scrofulous or manifestly of weak constitution." A total, as he says, of 64 per cent. of the marriages producing children in some way injuriously affected.

MM. Cadiot,[4] Devay[5] and Boudin[6] have also published

[1] Transactions American Med. Association, 1858, vol. xi. p. 323.
[2] Journal Psych. Med. and Mental Pathology, July, 1858, p. 393–4.
[3] Mem. to the Anthropological Society of London, vol. ii. 1866. See also *Edinburgh Med. Journal*, vol. vii. p. 872.
[4] Comptes Rendus, tome lvii. p. 978.
[5] Gazette Hebdomadaire, quoted in Edin. Med. Journ., vol. vii. p. 680.
[6] Annales d'Hygiène Publique, tome xviii.

statistics showing the evil effects of marriages of kin among their own countrymen.

If we now turn to the other side of the account we find equally positive results. In the first place M. Bourgeois[1] gives us the history of his own family, descended from a consanguineous union in the latter part of the 17th century. Eight of the marriages are those of cousins and the remainder, some sixty in number, all feel the influence of consanguinity. Yet only one union in the entire number has been infertile, and here the fault was undoubtedly in the wife, a woman of alien stock, while the husband was three generations removed from the nearest marriage of kin. In one branch there are four marriages of cousins in five successive generations, one of them being of double first cousins. Yet the children of this last union, being four times of kin, are six in number and are all well and bright save one, the victim of a traumatic accidental injury. The health of all the two hundred descendants is excellent, except in one family of grandchildren and great-grandchildren from the double cousin marriage, where a scrofulous taint has crept in.

Seguin[2] gives the particulars of ten marriages of kin in his own family, two of the number being of uncle with niece and the rest of first cousins, from which sixty-one children were born, most of whom lived to grow up, not a single one showing deaf-mutism, hydrocephalus, stammering or polydactylism.

Dally[3] gives a case of continued intermarriages between two families, all being of first cousins save two which were of second cousins. This has continued for five generations with an average of three or four children per marriage. The total number of branches direct and collateral is one hundred and twenty to one hundred and forty, though quite a number of the family have been celibates. There has been

[1] Comptes Rendus, tome lvi. p. 178.
[2] Comptes Rendus, vol. lvii. p. 254.
[3] Anthropological Review, May, 1864.

no case of idiocy or deaf-mutism, and but one of insanity, and that in an old woman.

M. Voisin[1] found in the isolated commune of Batz forty-six consanguineous marriages. Five were between first cousins, producing twenty-three children; thirty-one were between second cousins and produced one hundred and twenty children; and the ten remaining unions gave birth to twenty-nine children. All were healthy and free from deformities of every kind. The community consists of some 3,300 souls, and has always been very much isolated. They are simple, intelligent and moral, and not a single case of mental disease, deaf-mutism, albinoism, retinitis pigmentosa or any malformation could be found, though the inhabitants had closely intermarried from time immemorial.

These two classes of observations, so diametrically opposite in their conclusions, cannot both be accepted as fairly representing the facts. If, now, we look for a moment at the testimony with regard to specific constitutional defects, given in most parts by men agreed as to the generally unfavorable effect of consanguineous marriages, we find equally unreconcilable discrepancies. Take the point of idiocy, for instance. Dr. Howe's figures show that 44 per cent. of the children of persons related to each other were idiots, while Bemiss, in one set of his cases, found the idiots to compose 7 per cent. of all the children born, and in another set to amount to only 2 per cent.

In the matter of deaf-mutism, we have the statement of Dr. C. A. Cameron,[2] based upon the Irish census of 1881, that of the 5136 deaf mutes enumerated in that country, 135 (being 2.6 per cent. of the whole) were the children of first cousins. Yet Dr. Fitzpatrick, in the very discussion which followed the reading of Cameron's paper, asserted that in his experience almost every case of deaf-mutism occurred in persons born from parents who were related.

[1] Mémoires de la Société d'Anthropologie de Paris, vol. ii. 1865, p. 433.
[2] Med. Press and Circular, May 16, 1883.

Huth, in his interesting work, to which I am indebted for one or two of the foregoing references, has collected the results published by some fifteen investigators as to the proportion of deaf mutes consanguineously descended,[1] and finds the percentages given to vary from a maximum of 30.4 to a minimum of 3.9,—a range so great as seriously to invalidate the figures.

One or two discrepancies in the results of individual observers deserve to be noted. In this same matter of deaf-mutism, Boudin says,[2] that estimating the danger of a deaf mute being born from an ordinary marriage as one, in a union of cousins it is eighteen, in one of uncle with niece it is thirty-seven, and in one of aunt with nephew seventy. If this defect is due to the mere fact of consanguinity in the parents, its danger should vary directly as the nearness of the relation. But an aunt and nephew are no nearer than an uncle and niece. Why then should there be twice as much danger of deaf-mutism in the one case as in the other?

Again, it appears from the tables of Bemiss,[3] that the percentage of the "defective" in the children of third cousins is actually greater than in the offspring of second or even of first cousins. But it is manifestly absurd that effects due to the mere fact of consanguinity should be more disastrous where the degree of relationship is the eighth than where it is the fourth,—in persons having only 6 per cent. of the blood of a common ancestor than in those having 25 per cent.

Impressed by the unreliability of many of the statistics published upon this subject, I have gathered what cases I could hear of as a contribution to the study of an important subject. Before laying the results before you, I may be allowed a word regarding some of the difficulties of the problem. In the first place, all cases collected in this way are almost of necessity selected ones, and I cannot flatter

[1] The Marriage of Near Kin, London, 1875, p. 239.
[2] Annales d'Hygiène Publique, tome xviii.
[3] Trans. American Med. Assoc., vol. xi.

myself that my own form an exception to the rule. In recalling instances of consanguineous marriage, persons are apt to remember only those which have been made conspicuous; and nothing is more conspicuous than defectiveness among the offspring. The opposite kind of selection, viz., the suppression of unfavorable cases, is much less common, for if an individual should keep back an unfortunate page of his family history, his neighbors will know and report the facts, even while they become oblivious of the uneventful commonplace cases. It is the ill news that travels fast and far. At least three of the unfavorable cases in my list I heard of from multiple sources.

In judging of the results, moral factors have to be allowed their just value. Intemperance, which was present for instance in most of Dr. Howe's cases, the depraved morality attendant on incestuous unions, the luxury and dissipation prevalent in many royal and noble families, the sloth and shiftlessness of many isolated communities, should often bear some at least of the responsibility that is put upon consanguineous marriages. Testimony is sometimes colored by religious prejudices in those who hold allegiance to the canon law. When one reads over the forty or more abnormalities ascribed to the intermarriage of kin, as in the cases published by Huth, and finds among them such diseases as psoriasis and whooping cough, he is forced to believe that the narrator was run away with by his hypothesis.

The great difficulty, after all, is in cases where the children of relations display any taint or defect, to exclude the influence of morbid inheritance. The influence of this factor is very evident in some of my own cases, and is abundantly sufficient to account for the evil results had there been no relationship between the parents.

In regard to inheritable diseases in the parents, I have often been unable to gain information. But no one I think can deny that simple heredity may have borne an important

part in most of the cases. Whether it will account for all the facts is a question which we must reserve till later. Now one very important conclusion follows, namely, that a case where no evil result follows a consanguineous marriage is of more value as evidence against the intrinsic harmfulness of such a union than an unfavorable case is for its harmfulness. For in the former instance at least we know that consanguinity was harmless; in the latter we know that *something* was harmful; it may have been consanguinity or it may not. In other words, the effect being removed there can have been no efficient cause, not even consanguinity; the effect being present, the cause must be look for among *all* the antecedents, not consanguinity alone. If then there were an equal number of good and bad results from such unions, the evidence would preponderate in favor of the harmlessness of the element of consanguinity. I have tabulated one hundred and eight cases of consanguineous marriage, collected from various sources, professional and non-professional. None of the cases, so far as I am aware, have been published before. In eighty-six instances the relationship was that of first cousin; in four, first cousins once removed; in thirteen, second cousins; in one, third cousins; in one, cousins, degree not specified; in one, uncle and niece; in two cases the parents bore the relation to each other of brother and sister.

I have classed as healthy only those individuals who appeared to be free from any congenital defect or disease, and who had an average degree of intelligence and bodily well-being. On this principle among the non-healthy are included all who suffered even from such slight defects as stammering and strabismus; all who were "under par" in intelligence or "not strong"; all who had phthisis, even though that disease developed late, and the individual was for thirty or forty years considered well; all who died in infancy, unless there was evidence that the death was from

some acute disease and independent of any possible inherited taint.

With this somewhat stringent interpretation of the word, I find three hundred and twelve "healthy" children out of a total of four hundred and thirteen, the direct offspring of consanguineous marriages,—the per cent. being about 75½.

The non-healthy individuals comprised:

Deaf Mutes, ...	12
Insane, ...	7
Idiots, ...	13
Blind, ...	3
Died of Consumption, ...	15
Nervous, ...	5
Of less than average intelligence, .	8
Died in infancy, ...	16
Not robust, ...	6
Hermaphrodite, ...	1
Died of Meningitis, ...	2
Cross-eyed, ...	2
Still-born, ...	2
Deaf (not congen.), ...	2
Stammerers, ...	2
Myopic, ...	2
Deformed, ...	2
Epileptic, ...	1
Total,	101

Among these one hundred and one persons were also duplicate defects, as follows:

2 cases of talipes varus.
1 case " somnambulism.
1 " " myopia.
1 " " polydactylism.
1 " " epilepsy.
2 dwarfs.

TABLE OF 108 CASES OF CONSANGUINEOUS MARRIAGE.

Cases marked * are of Consecutive Consanguinity.

No. of Case.	Relationship.	Husband's Occupation, etc.	Years Married.	No. of Children.	Healthy Children.	Deaf Mutes.	Insane.	Idiots.	Blind.	Died in Infancy.	Children's Children.	REMARKS.
1	1st cousin		25+	9	8							8 dissolute; 1 nervous, bordering on insanity.
2	1st cousin		25+	8	3	5					(1st) deaf mute, had 2 sons also d. m. (2d) had 1 son healthy. 2 mar. relatives (see cases 3 and 4). 3 unm.	"All smart."
*3	1st cousin	son of No. 2	25+	2	1							Both above the average in intelligence. 1 died at 30, of phthisis.
*4	uncle and niece	son of No. 2	25+	2	2							Twins.
5	1st cousin		25+	3	2		1				See No. 6.	
*6	1st cousin	son of No. 5	25+	3								2 children below par in intelligence. One child a hermaphrodite.
7	1st cousin		25+	5	3			2			See No. 8.	The idiots also had talipes varus.
*8	1st cousin		25+	4	4							Wife = daughter of No. 7. Children "rather smart."
9	1st cousin		25+	1	1							

10	1st cousin	Cases 1—32 inclusive, all farmers or fishermen.	25+	5	1	1					(1st) 8 children of whom 1 myopic, others healthy. (2d) 3 children died in infancy	3 nervous (hysterical, neurasthenic).
11	1st cousin		25+	4	3						(1st) had several children, all healthy.	1 child died at 40 years, of phthisis.
12	1st cousin		25+	0								
13	1st cousin		25+	2	2							
14	1st cousin		25+	2	2						Daughter had 3 children, 1 d. of ovarian tumor.	
15	1st cousin		25+	6	3	3					(1st) deaf mute, had 4 chil. also d. m., and 3 or 4 who were not: one of the former = No. 16. 5 others all had chil. of average ability.	
*16	2d cousin		5	1				1				Wife = grand-child of 15, deaf mute.
17	2d cousin		25+	4	4						1 m. and had 2 deaf mutes.	
18	2d cousin		25+	3	2	1						The deaf mute also epileptic.
19	1st cousin		25+	1		1						
20	1st cousin		25+	4	4							
21	1st cousin		25+	2								(1st) d. of phthisis, aged 25. (2d) always an invalid.
22	1st cousin		25+	2	2						See No. 23.	
*23	1st cousin	son of No. 22	10	2	1							1 precocious, d. of cerebral meningitis.
24	1st cousin		25+	3				1				2 had internal strabismus.
25	2d cousin		25+	2						1		1 still-born; 1 d. at 3 yrs. of scrofulous meningitis. Wife also had 1 miscarriage.

No. of Case.	Relationship.	Husband's Occupation, etc.	Years Married.	No. of Children.	Healthy Children.	Deaf Mutes.	Insane.	Idiots.	Blind.	Died in Infancy.	Children's Children.	REMARKS.
26	1st cousin		25+	7	5		2				One, of average intelligence and health, m. and had 6 chil.; 3 d. in infancy, 1 d. of epilepsy, 1 is an inebriate.	
27	1st cousin		25+	5	4							1 nervous.
28	3d cousin		25+	2	1			1				
29	1st cousin			1	1							1st wife.
30	1st cousin		25+	6	5	1						Second wife of above.
31	1st cousin		25+	2	2						Daughter had 8 chil., some with scrofula. Two d. of phthisis.	
32	2d cousin		25+	3	3							One daughter d. of "softening of the brain" at the climacteric.
33	1st cousin			5	2		1				(1st) See case No. 34. (2d) mar., childless. (3d) two chil.—1 healthy, the other erratic and partially blind.	Wife's brother insane; one of her parents, two sisters and a brother d. of apoplexy. Husband d. of apoplexy. One child deaf (not congenital) and somnambulist. The daughter has periodical insanity, attributed to disappointment in love. A son d. at 40 of phthisis.
*34	2d cousin	son of No. 33		0								Apoplexy and insanity in husband's antecedents; himself healthy.

35	1st cousin			3	2 twins.			1 (sl)			Children all unmarried.	Husband=brother of wife (in case No. 33). He d. of apoplexy at 60. Married cousin, mother's side. His sister (No. 33) married cousin, father's side.
36	1st cousin			2							(1st) see case No. 37. (2d) unmarried.	Wife=sister of wife, cases 33 and 38, and of husband cases 35 and 39. 1st child blind of one eye (congenital). 2d " " of both eyes. "
*37	2d cousin			2	1			1				Wife, blind of one eye=daughter of case 36. Idiotic son d. at 17 years; girl, intelligent, d. young.
38	1st cousin			2	2						(1st) 3 healthy children. (2d) 4 " "	Wife = sister of husband of case No. 35. Died of apoplexy at 80.
39	1st cousin			1	1						Child unmarried.	Husband=brother of wife in case No. 38, and of husband case 35.
40	1st cousin	merchant	25+	6	6					1		Died of croup.
41	1st cousin	farmer	18	2	2							
42	1st c., 1 rem.	carpenter	15	2	2							
43	1st cousin	fisherman	25	3	3							
44	2d cousin	merchant	3½	3	3							
45	1st cousin		15	3	3							
46	1st cousin	druggist.	5	0								Wife had atresia vaginæ.
47	1st cousin	professor.	25+	7	7					1	(1st) 4 children. (2d) 8 " 1 son and 1 dau. d. in infancy, 1 son threatened with chorea, did not have it. (3d) 4 child. 1 dau. was temporarily insane (religious causes); recovered. (4th) 5 child.	Husband a man of note, 1 dau. a little "over developed" nervously (vivacity and tendency to exaggeration). Original marriage about 1800. 1st generation, 7 children. 2d " 31 " 3d " 42 " 4th " 1 " Total in 1885 =81

No. of Case.	Relationship.	Husband's Occupation, etc.	Years Married.	No. of Children.	Healthy Children.	Deaf Mutes.	Insane.	Idiots.	Blind.	Died in infancy.	Children's Children.	REMARKS.
47	(continued)										(5th) 6 child. 1 eccentric. (6th) 4 " 1 slightly lacking mentally. 3d generation = 42 from 17 ms., 14 fertile, 3 non-fertile all of one family. 4th generation = 1 from 1 marriage.	All of these 81 persons healthy with the 2 exceptions noted & 1 grandd. invalid from ovarian t. Family of unusual intellectual power. 4 Med.Mass.S.S.
48	2d cousin	professor	16	5	5							Deaf-mutism in wife's family, and deafness (not congenital) in husband's family on the sides where there is no relationship.
49	1st cousin			1	1						Married 5 years, no children.	
50	1st cousin			5	5							
51	1st cousin	physician	8	1	1							
52	2d cousin	apothecary	25+	3	3					1	1 married 3 years; has one healthy, remarkably bright child.	1 child d. acute disease.
53	1st cousin	agent	7	4	4							"All as active, intelligent and healthy as the best of American children."
54	1st cousin		17	3	3							"Very bright."

55	1st cousin	druggist	25+	4	4						1 married, 3 children, all healthy. 1 died of diphtheria.	
56	1st cousin	merchant	10	4	4							1 died of scarlet fever.
57	1st cousin			1	1							Wife d. of anæmia soon after birth of child. Son now 21, "full, strong and healthy."
58	1st cousin	merchant	20?	3	3							Wife had 1 miscarriage.
59	cousin	farmer	25+	8	8						(1st) 3 children. (2d) 3 " (3d) 4 " (4th) 4 " (5th) 2 "	Wife's brother died of "wasting palsy." Her family nervous; some of the daughters not very robust, but yet in good health.
60	2d cousin	merchant	11	3	3						Dau. m., no issue. Son m., " " In each of these cases there is uterine dis. in wife.	Son very bright, d. at 8½ of an acute disease. Other son M.M.S.S.
61	1st cousin	merchant	25	5	5							All unusually intelligent. Son, athlete in college; now M.M.S.S.
62	1st cousin	farmer	25+	2	1					1		1st son very precocious, great memory, lawyer. 2d son died at 6 weeks, peculiar shaped head.
63	1st cousin	merchant		2	2							
64	1st cousin	farmer	1?	1	1					1		Wife = sister of wife in case No. 62. Child probably died of acute disease.
65	bro. & sist'r			1							Unmarried.	Intelligent, but peculiar owing to facts of parentage becoming known in the village. Died of phthisis at 25–30.
66	bro. & sist'r			1	1						Had 1 son, perfectly well in every way, now a leading citizen.	The son very strong, blacksmith, intelligent, carried on business for himself, lived to great age.

No. of Case.	Relationship.	Husband's Occupation, etc.	Years Married.	No. of Children.	Healthy Children.	Deaf Mutes.	Insane.	Idiots.	Blind.	Died in Infancy.	Children's Children.	REMARKS.
67	1st cousin	physician		2								Husband d. of phthisis. Both children intelligent and perfect, d. of phthisis at about 20 years.
68	1st cousin	farmer		1	1						Unmarried.	Wife 15 years older than husband.
69	1st cousin	merchant	25+	8	3						(1st) married, no issue. (2d) 2 children. (3d) 1 or 2 children. (4th) 1 child. All of 3d generation healthy.	2 and probably 3 of husband's brothers forgers, defaulters, etc. Seemed to have no motive for dishonesty. (Two of these brothers had only 1 child each, one of latter died in infancy.) 1 son well, served in war, died at 40 of phthisis. 2 sons are well except that they stutter, which has put them at disadvantage and interference with their education. Neither can write a good business letter. 1 son an athlete in college, now not strong. 1 son in business but thought "rather wanting in smartness," died at about 35 of brain disease.
70	1st cousin	merchant	+	3	2						1 married, no issue.	Husband's brother, chronic bronchitis and asthma many years; m., no issue. Another brother, invalid, unmarried. Wife, very deaf, has brother and sister each with issue. 1 son, well but not very enterprising. 1 daughter, deaf and nervous.

71	1st cousin	merchant	25+	2	1						Mothers of husband and wife=sisters; belonged to a family consisting of 7 daus. and 2 sons, *all* of whom d. of phthisis. Wife had 4 sisters and 1 brother; 3 of these have d. of phthisis. Dau. has narrow chest, subject to catarrh, colds and coughs, so that she "has to take care of" herself, but has had very little sickness, is very bright. Son, great eater, fat, dull and slow: supernumerary toe; myopia, tendency to pulmonary troubles.
72	1st cousin	farmer	25+	8	8						1 dau. d. 1st pregnancy. All the children in this and foregoing case plain, though parents, especially wife (71) good looking. No relation between 71 and 72.
73	1st cousin	lawyer	25+	8	2			1		5	Daughter beautiful and accomplished, m. and had 1 imbecile child.	Heredity unknown. Idiot d. at 18. 1 son precocious, d. 7 years, cause unknown. Cause of infants' death unknown.
74	1st cousin	farmer.	25	7	4					1		Infant d. umbilical hæmorrhage. 2 others rather dull, one has some "malformation of throat."
75	1st cousin	professor.		1	1							Husband and wife "of opposite temperaments."
76	1st cousin	manufacturer	15	1	1							
77	1st cousin			7	2			5		2		The 2 healthy ones d. in infancy. 4 idiots died; one now living æt. 45, has a conical head.
78	1st cousin			1	1							Son now 20, very bright.
79	1st cousin			1	1							

No. of Case.	Relationship.	Husband's Occupation, etc.	Years Married.	No. of Children.	Healthy Children.	Deaf Mutes.	Insane.	Idiots.	Blind.	Died in infancy.	Children's Children.	REMARKS.
80	1st cousin			2								Both "deformed;" son a fine bass singer.
81	1st c., 1 rem.			7	4		3				All unmarried.	Husband's father drank and died insane. Wife's father had apoplexy late in life and died insane. Wife's brother now insane from use of alcohol. 3 children showed signs of insanity at puberty. 2 have passed puberty and are healthy. 2 are under 10 years.
82	1st cousin	merchant	18	7	5					2		Husband inclined to phthisis; also his father. Wife's mother nervous. 2 children d. cholera morbus. 1 d. scarlet fever; 1 stupid, slightly deaf. 1 dau. very nervous, has just m. double first cousin.
83	1st cousin	none	20	4	2							All child. bright. 1 has weak eyes, 1 has had "fits," epilepsy(?) but carries on business with success.
84	1st c., 1 rem.	member of the Bos. Tea Party.	25+	11	11					1	In 1st gen. 11, " 2d " 23, from 7 marriages (5 fertile). In 3d gen. 54 from 15 marriages (10 fertile, 2 infertile 3 no record). 4th gen. 10 from 3 marr. (all fertile). Total descendants 98 in about 100 years.	Family of much intellectual power, including 3 physicians of note, all college professors. In the oldest branch 5 males 6 ft. 3 in. and upward. (2 = 6 ft. 4½ in.) Only defects = 1 dipsomaniac (2d generation) who got alcoholic tendency from mother (of another family), and perhaps 1 insane (2d gen.).

*85	1st cousin			6	2					2	1 married twice, no issue.	Husband = grandson of 84. Wife = sister of dipsomaniac (see above). 1 dau. at 47 a dwarf and rather deficient in mind but not an imbecile. 1 son d. at 21 of phthisis.
86	1st cousin		25+	0								
87	1st cousin	farmer	25+	9	9					3	(1st) had 11 children. (2d) " 2 " (3d) " 14 " (4th) " 3 " (5th) " 7 " All healthy.	Husband an early Mass. settler, born 1694. Children died (except 3 in infancy) at 81, 61, 87, 78, and 47. (1 not known.)
88	1st cousin	farmer	25+	11	11					2	(1st) married a N. H. settler and was ancestress of well known N. H. family. (2d) see Case 89. (3d) " " 90. Records of descendants of others unknown.	Husband = nephew of 87 (born 1746), also brother of husband Case 91. Wife=sister of wife Case 91. Recorded ages of child. at death, 40, 61, 32, 69, 25, 65, 65.
*89	1st cousin		25+	7	7						All m. and had issue.	Husband, officer, killed war 1812=son of 88. Children died at 73, 38, 60, 47, 72, 41 and 55 years.
*90	1st cousin	U. S. Marshal	25+	8	8					2	3 married, not known if issue.	Husband=son of 88 and brother of 89. All children but 1 girls. All bright & pretty. Died at 28, 26, 32, 26, 15 and 19. No inherited disease.

No. of Case.	Relationship.	Husband's Occupation, etc.	Years Married.	No. of Children.	Healthy Children.	Deaf Mutes.	Insane.	Idiots.	Blind.	Died in infancy.	Children's Children.	REMARKS.
*91	1st cousin	physician	25+	9	9					1	8 married, all had issue. (1st) 4 children. (2d) 10 " (3d) 2 " (4th) 6 " (5th) 5 " (6th) 6 " (7th) 8 " (8th) 9 " No diseases in 2d generation except 2 cases of phthisis (d. 46 & 38) both in 1 family. 6 of the 50 child. of this 2d generation are recorded as having d. in infancy. 1 child in 3d generation has epilepsy.	Husband=brother of husband in Case 88, was medical director of Continental army in Revolution. Child. d. at 67, 71, 78, 82, 78, 70, 80 (1 living at 77). The descendants of this family remarkable, comprising in 1st & 2d generations—2 R.R. presidents, 1 bank president, 2 Atty. Generals (State), 2 overseers Harvard Univ., 3 state senators (1 pres. of senate), 1 college professor and president, 1 judge, 1 supt. of schools, 2 clergymen, 2 lawyers, 5 successful phys. (1 ex. pres. M. M. S.), etc.
92	1st cousin	naval officer	25+	6	5						1 m., has 1 healthy child.	1 child d. young (18?), cause unknown. 1 dau. invalid, neuralgia. 2 sons, healthy, dissipated. 1 son (m'd) d. scarlet fever.
93	2d cousin		15	3	1					1	Unmarried.	1 still-birth from neglected labor. 1 d. marasmus when a few hours old (born soon after a miscarriage). 1 dau. very intelligent and cultivated.

94	1st c., 1 rem.		8	3		3					1st dau. m., childless. 2 next daus. married brothers, 1 without issue. 1 had 6 child. small in stature and some not robust. All very bright. Of these 1 m. and has issue.	Husband=brother of Case 93. His mother had "weak lungs." The two older dau's were much worn by teaching before marriage, 1 of them (now æt. 70) said to have "weak lungs."
95	1st cousin	Cal. pioneer	1	1				1				Heredity not known. Child now 25 years, dwarf, cannot walk: brutish.
96	2d cousin	farmer	25+	3	1						1 m. (see Case 97).	Husband's 2 brothers d. phthisis. 5 children of 3d brother d. phthisis. A sister had "weak lungs." 2 children d. phthisis at 24 or 25.
*97	1st cousin	merchant	25+	8	3					1	1 m., 2 healthy children.	Husband=son of 96. 1 child d. at 3, "scrofula." 1 d. phthisis at 23. 1 " " " 25. 2 others not robust.
98	1st cousin			3								Heredity unknown. 1st child deaf, myopia, night blindness (no oph. examin.), very bright. 2d not bright, talks indistinctly. 3d bright, feeble health.
99	1st cousin	none	25	2	2							
100	1st cousin	master painter	6	2	2					2		Both d. acute non-tuberculous infantile diseases.
101	1st cousin	merchant	18	3	3							

No. of Case.	Relationship.	Husband's Occupation, etc.	Years Married.	No. of Children.	Healthy Children.	Deaf Mutes.	Insane.	Idiots.	Blind.	Died in infancy.	Children's Children.	REMARKS.
102	1st cousin	merchant	10?	5	4						(1st) phthisis, m., childless. (2d) 7 healthy children.	Husband d. "quick consump." æt. 31=bro. of husband Case 103. Wife d. of phthisis = sister of wife Case 103. 1 child d. phthisis. 1 drowned. 2 d. unknown causes. All bright; no diseases except 1 case phth.
103	1st cousin	merchant	25+	16	16						1 son unm. 1 son m. (see Case 104). 12 daus., all m., 1 had no child. The other 11 all had issue and most of them large families. All healthy. (1 dau.=Case 108.)	Husband = bro. husband Case 102. Wife = sister of wife Case 102. 4 sons & 12 daus, all grew up. 2 sons drowned, unmarried. Oldest child now living at age of 80.
*104	1st cousin		25+	6	6						(1st) son, m. (see Case 105). (2d) dau., 4 chn. (3d) son m., has issue. (4th) son, 3 chn., all healthy. (5th) unm.	Husband = son of Case 103. 1 child, killed by accident, unmarried.
*105	1st cousin	merchant		3						3		Husband = son of Case 104, grandson of Case 103. The children all perfectly formed but d. just after birth.
*106	1st cousin		2	0								Wife=grand-d. Case 103. This her second marriage. By former husband had 3 chn.
*107	1st cousin	pay mast. U.S.N		4	4							Wife = grand-d. Case 103 and sister of wife Case 106.
*108	1st cousin		25+	10	9						7 chn. m. and all had issue (1 had 10 chn.), all healthy.	Wife = d. of Case 103. 1 child d. phthisis, unmarried.

In all of the one hundred and eight marriages, save five, there was issue. In one of these infertile cases there was mechanical impediment present in the wife, and in another the marriage has lasted only two years. In fifty-seven cases only, is it known that husband and wife lived together the average period of fertile married life, which I have assumed at twenty-five[1] years. The total number of children born from these fifty-seven unions, only two being infertile, is two hundred and eighty-two,—an average of about five children per marriage.

In seventeen of the marriages the contracting parties were one or both descended themselves in the first or second generation from consanguineous unions; one of them was blind, another a deaf mute, child of a deaf mute. Fifteen of these marriages have thus far been fertile, with a total of sixty-eight children, of whom forty-eight, or 70½ per cent., were "healthy." The remaining twenty comprise two idiots, three below average intelligence, five who died of phthisis, one of meningitis, five who died in infancy, one hermaphrodite, one scrofulous, two not robust.

Only nine of these consecutive consanguineous marriages are known to have lasted through the complete period of conjugal fertility. These nine produced fifty children, an average of 5.5 each.

The statement has often been made, as for instance by Guipon,[2] that when sterility does not attend the marriage of relatives it yet shows itself in their offspring. Our tables give the facts regarding one hundred and twenty-eight marriages in which one or both parties were descended in the first or second generation from consanguineous unions,

[1] Bemiss has assumed the extreme average length of time that married women continue to produce in this country as twenty-two years. That standard would not have admitted any larger number of my own cases into the category of those having completed their reproductive career than does the one I have preferred.

[2] Comptes Rendus. vol. lvii. p. 513.

but themselves married persons not related to them. Of these one hundred and twenty-eight unions, some of which have lasted but a short time, one hundred and ten, or 86 per cent., have thus far proved fertile. The number of children cannot be told, because my information in many cases is simply that there was issue. Interpreting that expression to mean only one child, there are, at least, three hundred and seventy-two children. In forty-seven of the cases only is there evidence that the union has lasted twenty-five years, and at the same time a definite record of the number of children. These forty-seven marriages give two hundred and forty children, an average of 5.1 children each. As to the proportion of disease among the offspring, no calculation can be made in the absence of a definite statement of the number of the offspring. Suffice it to say, that only thirty-seven cases of abnormality are recorded among all these children. They include eight cases of deaf-mutism, six being in children of deaf mutes. This point will be again referred to. Eighty-eight of the one hundred and ten fertile marriages have no cases of disease among any of the offspring.

The first thirty-two cases are all from one isolated community on the north side of the island of Martha's Vineyard. They were kindly furnished me by Dr. L. H. Luce, a member of this Society, resident upon the island. The inhabitants are farmers and fishermen of average intelligence and good character, not addicted to drunkenness. A lack of enterprise, associated doubtless with the nature of their occupations, seems to be the cause of their intermarrying. It will be noticed that all the instances of deaf-mutism occurring in the whole series of cases are to be found in this group representing one little town of Martha's Vineyard.

Cases 33 to 39 inclusive, are from another isolated community on Point Judith, in which was a marked inheritance of apoplexy and insanity. The remaining cases are scattered

about, many of them in this vicinity. All are of American birth, and represent perhaps the better classes socially.

Do these facts warrant us in supposing that there is a specific degenerative effect caused *ipso facto* by consanguinity? Regarding first the rate of fertility; the offspring averaged 5 to each marriage of relations, 5.5 to each case of the children of relations marrying kinsmen, and 5.1 where the children of relations married strangers. Unfortunately we have no fixed standard with which to compare these figures. The article on population in the Encyclopædia Britannica gives 4.51 children as the average product per marriage in England. We know, however, that social and economic considerations affect the number of births as much as do physiological factors. I think it will be generally admitted that the average fertility of these cases compares very favorably with that of most American families. As to the general health rate of the children, we are again without a normal standard of comparison. Each must judge for himself as to the significance of the figures. For one, however, I doubt if more than three-quarters of the general community are free of the major and minor defects and diseases for which the children of these consanguineous unions have been excluded from the category of the healthy. The ratio of those dying of phthisis is remarkably small, being only 3.6 per cent. of the whole number born. Even if we add those "not robust," the proportion of consumptives remains well within the average bounds.

There are three defects only which attract attention as being more frequent than would be expected. These are deaf-mutism, in 2.9 per cent. of all the children, insanity in 1.7 per cent., and idiocy in 3.1 per cent. Regarding the first of these, we notice that all twelve of the cases of deaf-mutism in the children of persons related, and the eight cases which occur in the children of those consanguineously descended but not marrying kin, were found in one locality,

viz., the town of Chilmark on the island of Martha's Vineyard. Of the eight cases last mentioned six were the children of deaf mutes. Dr. Luce, to whom I am indebted for these facts, and who is well acquainted throughout the island, informs me that there has never been to his knowledge a case of deaf-mutism anywhere on the island save in the town of Chilmark. To be sure, he adds, that so far as he knows there is no intermarrying in the other portions of the island, because the inhabitants are more enterprising and have freer intercourse with the main land. He also sends me, however, the particulars of two families in Chilmark, in neither of which was there any consanguinity among the ancestors. The bride in one case was from New Brunswick and in the other was a Portuguese. The former gave birth to one deaf mute, the latter to two. Moreover, other degenerative conditions appear to prevail in this same town, owing to some cause which is not consanguinity. For I learn on the same authority of a case of idiocy where none of the ancestors had ever married a relative. Again, in another family equally free from any consanguineous "taint," among five children there were three hermaphrodites.

The seven cases of insanity occurred in four families. Four of the individuals so affected had a marked inheritance of insanity, three of them deriving it from both the father's and the mother's side. The two families in which the remainder of the cases were found, were both from Chilmark, and nothing definite is reported as to the mental soundness of their ancestry.

The proportion of cases of idiocy, while very small compared with the figures given in some of those observations that have become the standard for the popular ideas on this subject, is yet in excess of the ratio of idiots to the community at large. How far this proportion is representative of the actual facts, and how far it is affected by imperfections in the data, I am not certain. Of the thirteen cases of idiocy

among the four hundred and thirteen children, six are reported from the two isolated communities already mentioned. One of these had a mother and grandmother both deaf mutes. The other seven cases all came to me through non-professional sources, and particulars regarding the parentage are unfortunately wanting. The memorandum as to one family said to contain five "fools" was given me through a second person, and it has not been possible to obtain any further information. I have included the case for what it may be worth, but do not feel quite certain that the total figures for idiocy are not unduly augmented by some error in the one case that furnishes so large a part of them.

Taking into account the fact already alluded to, that some of my lay informants have sent me an unfair proportion of the *causes celèbres* of their vicinity, the total results, it seems to me, are not such as to show any special or conspicuous deterioration peculiar to the children of relations. Of course no one will deny that a union, consanguineous or otherwise, which brings together two individuals having any disease or morbid tendency in common, will involve a direct danger to the offspring. Is it not possible, then, to account by the ordinary laws of morbid inheritance for such untoward results as sometimes follow the marriages of kindred?

The first objection that is raised against this view is that the children of relations are sometimes diseased when the parents themselves seem to be quite healthy. In answer to this, we may say that a more careful examination would often show that the opinion entertained by a merely casual observer regarding the parents' health was ill-founded. Again, the well-known phenomenon of atavism will account for cases where diseases are absent, or rather latent, in both the persons marrying, which were yet present in their common ancestor or in some close collateral branch, and which are capable of transmission through the married kinsfolk to appear again with reinforcement in their offspring.

Another and stronger objection urged by those who believe in a specific evil effect produced by non-renewal of the blood, is furnished by one or two diseases which are sometimes difficult to account for on the ground even of atavistic heredity. Foremost of them in importance for this argument, though a very rare affection, is hemeralopia or retinitis pigmentosa. Some of the leading of ophthalmologists believe that the disease has a specific relation to consanguineous descent. Dr. Derby, for instance, who has kept a careful record of all such cases, informs me that in a total of 12,130 cases in his ophthalmic practice, he has met twenty-three cases of retinitis pigmentosa. In nine instances, the individuals were descended from relations, in six the parents being first cousins, in three being second cousins, and in one the grand-parents being first cousins. In one instance there was no information obtained on this point, and in thirteen there was no relationship in any of the ancestors. In none of these twenty-three cases was any other form of weakness or disease noted. Dr. Derby has also kindly placed at my disposal his collection of the recorded cases of other observers. These amount, including his own just referred to, to two hundred and ten cases; in seventy there was relationship, in one hundred and thirty-nine no relationship, in one no information.[1] The records of the ophthalmic service of

[1] The statistics reported by other observers are as follows:

Pagenstecher reports eleven cases. Parents not related.
Liebreich, ninety-five cases. Parents first cousins in forty-three.
Mooren, thirty-four cases. Parents first cousins in nine; not related in the others.
Hoering, two cases. No relationship.
Stoer, one case. " "
Hoering, four cases. Parents first cousins in one.
Hutchinson, one case. No relationship.
Haase, one case. " "
Monoyer, five cases. " "
Jeffries, three cases. " "
Simri, three cases. " "
Windsor, one case. " "
Swanzy, one case. " "
Harlan, one case. " "
Landolt, one case. " "
Mooren, eight cases. Parents first cousins in three.
Hocquard, fifteen cases. Parents first cousins in five.

the Carney Hospital of this city, which have been kept with especial care on this point, and which Dr. Standish has kindly gone over for me, show in a total of 3,726 patients three cases of retinitis pigmentosa. In one there is no record as to consanguinity, in one there was no relationship, and in one the parents were first cousins.

Deaf-mutism is another defect that is often not transmitted directly from an identical form of disease in the ancestor, and it has therefore been ascribed to consanguinity of parents. But Roosa[1] states, that inasmuch as the disease is often due to inflammatory action, it is not likely to be transmitted as such by inheritance. He says that the causes of deaf-mutism are as numerous as those of deafness unaccompanied by mutism. The intra-uterine causes of the disease, operative perhaps in one-half the cases, are quite unknown. The proximate antecedents of hemeralopia are equally obscure. There is some reason to believe that transitory mental states, such as intoxication, may determine the procreation of an idiotic child. On the whole it seems likely, as has been pointed out by Dr. Child (*loc. cit.*), that all these disease may stand in a relation, as yet unrecognized, to other neuroses present in the ancestors of the persons afflicted, as chorea is connected with rheumatism, or as the phenomenon of blue eyes in cats is associated with deafness.

If we were to accept the conclusions even of Chazerain, who assigns 30 per cent. of deaf mutes to consanguineous descent (a figure vastly in excess of anything that can be substantiated), and if we allow that a third of the cases of retinitis pigmentosa are in the offspring of relations; it yet remains true that the large majority of cases of these defects are due to causes independent of consanguinity. The hereditary taint under these circumstances is not always recognizable, but we know it is there. Why assume two

[1] Practical Treatise on Diseases of the Ear. By D. B. St. John Roosa, New York, 1885.

specific causes to account for one effect, especially when the cause assumed for the minority of cases accounts for them no more intelligibly than would the other cause which is known to be operative in the majority of cases? Is it not more reasonable to suppose that those confessedly obscure nervous affections whose connection with any similar defects in the ancestors we are unable in some cases to trace, may yet, with growing knowledge of the pathogeny and relations of disease, be brought under those great laws whose effects upon heredity are so well established?

ARTICLE XXV.

HOW A LESION OF THE BRAIN RESULTS IN THAT DISTURBANCE OF CONSCIOUSNESS KNOWN AS SENSORY APHASIA.

By MORTON PRINCE, M.D.
OF BOSTON.

READ JUNE 9, 1885.

HOW A LESION OF THE BRAIN RESULTS IN THAT DISTURBANCE OF CONSCIOUSNESS KNOWN AS SENSORY APHASIA.

WHEN Broca demonstrated that an injury to the base of the third frontal convolution on the left side of the brain caused a loss of the power of speech, the first step was taken towards the localization of the functions of the brain. But though all subsequent experience has confirmed Broca's discovery, more recent clinical observation has shown that this region is not the only one the integrity of which is required for the function of language; but that the destruction of other regions, as for example the island of Reil, the first two temporal and other convolutions, results in the impairment of this faculty. But on the other hand, while it has been shown that this is the case, it has also been determined that there are differences in the symptoms presented according as the impairment of speech is due to an injury to Broca's convolution or to some other spot. In other words, all aphasia is not the same, but the faculties retained and lost by aphasies differ: some for example can perfectly understand when spoken to, but cannot articulate or write; others can articulate, but cannot understand a single spoken word, though they hear perfectly all other sounds. Others can both speak and understand spoken language, but their speech is unintelligible; and so on. Various attempts accordingly have been made to construct a number of different types of aphasia, to which all cases may be more or less approximated. To understand the phenomena of aphasia it is necessary to carefully study the faculty of language as possessed by a normal individual. I have no intention of doing so here, further than to point out that for the complete faculty of speech, which is a complex

function, the coöperation of at least three different functions is requisite. In the first place, it is necessary to be able to hear the sounds of words (internally as well as externally), for a person may be deaf to words, though he has most acute hearing for all other sounds; secondly, there must be a sufficiently normal intellect in order that words may be combined with ideas; and thirdly, we must be able to coördinate the motor impulses to the muscles of the apparatus of speech. Clinical observation has further shown that these different faculties are distinct and separate, and that one can be lost while the other two are retained; but, that the impairment of any one, whether of the acoustic, the motor or the intellectual faculties, results in an impairment of speech, or aphasia. We are thus compelled to distinguish different centres in the brain corresponding to each of these functions, namely: an acoustic centre, where the sounds of words alone arise; a motor centre, where the impulses to the muscles of speech are coördinated; and a larger and diffuse centre for the intellect proper, where the word-sounds are associated with ideas. As the impairment of the intellectual centres comes within the domain of insanity it need not concern us further here. When the motor centre is affected, the resulting disturbance of speech is known as *motor*, *ataxic*, or *Broca's aphasia;* when the acoustic centre is at fault, as *sensory* or sometimes *paraphasia*. These are two of the principal forms of aphasia. Other forms have been distinguished, but it is not necessary for my purpose to consider them here.

Motor aphasia is the most common form. I will not trespass on your time by narrating cases of this well known type, but will briefly mention the following case in order that the type may be contrasted with the second variety.

A young woman, Hannah D., had an attack of apoplexy two years and five months before I saw her, and following an attack of rheumatism and probably endocarditis. At the time of my examination, the right hemiplegia which at

first had existed had entirely disappeared. Aphasia only remained. The only improvement of speech since the attack consists in the ability to say "no." She cannot say "yes." She can understand perfectly when spoken to. She can write her name, but nothing more. She can read to herself, but not aloud. She cannot repeat spoken language. In this case, then, there was

lost:	(*a*) volitional speech.	*retained:*	(*f*) understanding of spoken language.
	(*b*) repetition of words.		(*g*) " of written language.
	(*c*) reading aloud.		(*h*) faculty of copying.
	(*d*) volitional writing.		
	(*e*) writing to dictation.		

(She could write her name, and Boston as far as "Bo.," but not Massachusetts or anything more.)

Various schemes have been constructed to diagrammatically represent the mechanism of the different forms of aphasia. I may say here that in my judgment none of the many, thus far constructed, correctly accord with all the phenomena of aphasia; though the one given by Lichtheim is undoubtedly in the main correct. I have drawn on the board (Fig. 1) so much of it as is necessary for the purpose of this paper. This is probably correct so far as it goes. The intention is merely to schematically represent the different centres concerned in speech and their connections, without reference to what portion of the brain they are located in.

a is the auditory nerve which carries acoustic impressions to the centre A where the word-sounds arise. B is the centre for the intellect proper. M is the motor centre, and *m* the motor nerves. A B, B M and M A are commisural fibres connecting these centres.

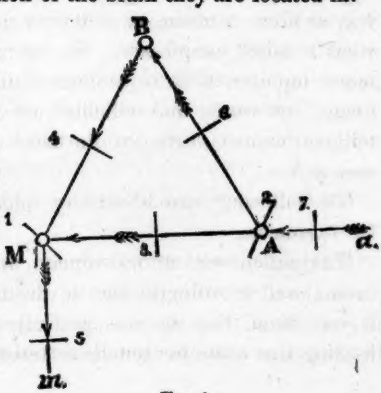


FIG. 1.

From a study of this scheme, if correct, it is apparent that seven different types of aphasia can *theoretically* occur, according as there is an injury to the centres A, B, M, or their connections. Lichtheim claims to be actually able to distinguish clinically these seven types. Be that as it may, the scheme enables us to understand the mechanism of the commonly recognized forms. In the motor form of which I have just spoken, the centre M, where the motor impulses to the muscles are coördinated, is destroyed. Hence ideas in B cannot resolve themselves into words. On the other hand, we can understand how such a patient can readily understand when spoken to, as the auditory centre A, the intellect B, and the connection A B, is intact. He might be able also to think in words, to write(?) and read (for simplicity's sake I have not represented the latter two centres), though he could not repeat words dictated.

If the centre A alone is destroyed we have the second form of aphasia I spoke of, namely, sensory aphasia. In such a case, though the patient can hear all other kinds of sounds, he is absolutely deaf to words. As B and M are intact the faculty of volitional speech is retained, but it is so modified that the patient uses the wrong words, and puts together syllables belonging to different words in such a way as often to make his sentences unintelligible. He has what is called paraphasia. He can properly coördinate the motor impulses so as to pronounce all the sounds of a language, but words and syllables are combined in an unintelligent manner, owing to the defect in the word consciousness at A.

The following case of sensory aphasia has been recorded by Wernicke.

The patient was an old woman, who was thought to be insane, and accordingly sent to the insane asylum. There it was found that she was perfectly sane, but, though her hearing was acute for sounds as tested by a watch, she was

stone deaf for words; that is, she understood absolutely nothing that was said to her. Although she could speak (thereby differing from the motor aphasic), her language was often meaningless, from the fact that she inserted wrong words in her sentences, and often distorted and senseless words. The meaning of her language, however, could be unravelled and was found to be rational.

It is this form of aphasia, where the consciousness of the sound of the word is lost,—sensory aphasia—which I propose to more fully consider here to-day. That there is a centre in the brain where the sound of the word is generated there can be no doubt. The case which I have just narrated to you conclusively shows this. This centre is distinct from that one where the motor impulses, which control the articulation of words, originate, and the destruction of which results in ataxic or motor aphasia. In the diagram these centres have simply been indicated, with their connections, without attempt to define their actual locations in the brain itself. In regard to their actual locations we are not yet prepared perhaps to express an opinion for all the centres. The motor centre without doubt is situated in the posterior third of the third frontal convolution—known as Broca's

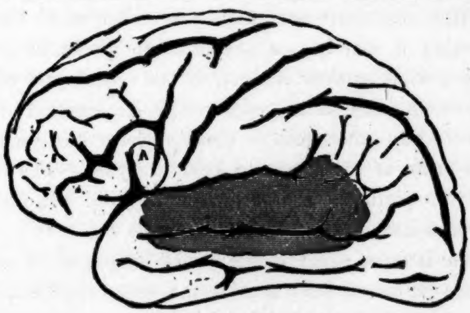


FIG. 2. (After Ferrier.)

convolution—and its neighborhood, in the region marked A in Fig. 2. Pathology has pretty clearly demonstrated

this. The auditory centre on the other hand is less firmly established, though there is every reason to believe that it is in the neighborhood of the sylvian fissure in the first temporal convolution.

A case of Wernicke points to this fact. The case was that of a woman who was supposed to be crazy and deaf, but was found to be suffering from word-deafness and paraphasia. At the autopsy there was found a thrombotic softening of the first and of a great part of the second left temporal convolution. (Fig. 2, shaded portion.)

Now the question which I am coming to is this. What do we mean by a centre for speech? How does it happen that a destruction of this centre causes a loss of the power of speech, and in particular a loss of the power of hearing words? In answer you say that here in this temporal convolution is the spot where the word-sounds are generated, and when this spot is destroyed, the apparatus is destroyed which generates the word-sounds. This is what is implied or hinted at in much of the language of medical text-books and periodical literature. If you will pause for a moment to reflect, you will perceive that such language means either very little or something which is so carelessly expressed as to border on nonsense. Can you conceive of the brain generating a sound, as a gas machine generates gas? If you can, what manner of thing is the sound, and what becomes of it after it is generated? Any notion of word-sounds or any other form of consciousness being a *product* of the brain is too crude to bear analysis. The moment you try to picture the process to your mind you are lost in a sea of contradictions.

If one is more exact in the use of language, he says that the acoustic centre for words is the spot where the activity of the brain is *accompanied* by the auditory sensations of words, and the destruction of which centre results in the loss of the faculty of understanding language, or thinking in

words internally. But again it may be asked *how* does the destruction of the brain end in loss of word-sounds? and *why* should the sounds be gone simply because the brain is injured? You have broken up a circumscribed piece of the brain; but do you see any likeness between that piece of brain and the sound of a word? The sound is a form of our consciousness; why then should it not exist, though the brain be broken? You may answer that it is the *function* of this part of the brain to——do what? *produce* word-sounds? This brings us back to the first difficulty, of conceiving of a sound as something produced. Can you not conceive of your having sounds without a whole brain? Why then, I repeat, should the consciousness of words be gone, because a spot of brain is broken up? Examine this piece of brain as much as you please. Bring your microscopes to bear; dissect it, till you have made out that it is made up of cells and nerve fibres, of connective tissue and blood-vessels; analyze it in your chemical laboratories till you discover it is composed of protoplasm, of myelin, of fibrin and what not. Increase the power of your microscopes till you see the very molecules of protoplasm as they beat against one another in the myriads of cells of the brain, and after you have done all this, have you found anywhere anything like a sound?

But sound is the *function*, you answer, of the brain. Well, look again through your microscope. Watch the blood course through the vessels; watch it transude through the walls of these vessels into the cells; watch it transude back again after its chemical constitution has been metamorphosed. Look into the cells themselves, and watch the very molecules as they vibrate in unison; watch the molecules, as the vibrating wave passes along the ingoing nerves into the cells, and watch how the wave passes out again as the molecules in the outgoing nerves take up the motion. Watch again the molecules as they combine and recombine in new propor-

tions with the new food brought by the blood, and see others cast out as effete products of metamorphosis. You have seen now the *function*; have you come across anything like the sound of a word? Where then does this sound come in? It is this question which I have brought before you for your consideration to-day, and which I shall endeavor to answer.

Let us look a little more closely into what happens when an artery, for example, breaks in the brain. The cortex of the brain, as you know, is made up of cells and fibres. As a result of the rupture, the cells are disentegrated and the fibres severed. Along the latter, neural currents are no longer carried, and in the cells nervous "force," so called, is no longer generated,—the molecular vibrations which accompany a state of consciousness, as the sound of a word, can no longer occur.

If we had examined more minutely the cells before they were broken up, we should have found that they are principally made up of nervous protoplasm, a very complex substance. We know that it is made up, like all material substances, of molecules, the smallest particles into which a substance can be divided without changing its composition. The activity of a nervous cell consists in the vibration of these composite molecules. It is this activity which accompanies the word-sound. But still in viewing this activity we have not yet got any nearer to the word-sound we are in search of. Let us go a step further and examine what we mean by a molecule and by molecular vibrations. A molecule is something which we picture to ourselves as having a certain shape and size; if in imagination we press it between our fingers, we perceive it has a certain density and hardness; we must regard it also as having a certain color, similar to that of a large mass of the same substance. Furthermore, when acting in conjunction with other molecules, we know it has a variety of physical and chemical properties. Its properties, as a whole, may be

described as the resultant of the properties of its constituent atoms.

But when we say that a molecule of protoplasm is of a certain color, shape and size, etc. etc., what do we mean by this? When we say that the molecules of protoplasm vibrate with one another, what manner of thing is this vibration? There is more in this question than seems at first sight. To answer it we must turn to our physiology, and inquire how it is that we see objects, and how it is that we recognize a molecule to have color, for example. What we shall find to be true of seeing, will also be found to be true of all our other senses.

I am going to represent here on this blackboard, by this indefinite figure (Fig. 3, *a*), a molecule of protoplasm, which we will suppose is in a cell in the brain A. We will imagine

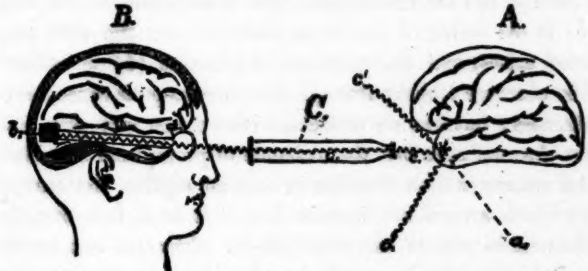


FIG. 3.

a person, B, inspecting it through the microscope C. The observer makes out that there is something there that is *octagonal in outline*, and *blue in color*. What is the physiological process by which he sees all this? Physics and physiology answer thus:—The vibrating waves of the ether, *c'*, *c'*, coming from the sun, are reflected from *a*, through the microscope C, towards the eye of the observer. After passing through the cornea, lens and vitreous humor of the eye, they impinge upon the retina. If we pause a moment to consider what has occurred, we may be surprised to find

that nothing like color, or shape, indeed nothing like a picture of a blue octagonal molecule has been created. So far the only phenomena presented are oscillations of the molecules of ether, between a point *a* and the retina; but now the motions of the ethereal molecules are transmitted to the retina and to the molecules of the nervous protoplasm in the optic nerve. Along the optic nerve, along its prolongations, deep into the brain the motion is continued, till the waves reach the occipital lobe of the brain; here the cells of the cortex are at last reached, and to the molecules in their cells the motion is communicated. Even then till we reach these cells nothing like color has appeared. Sever the line of communication at any point between *a* and the cells of the cortex, and nothing like color exists, though the molecules of ether around A are still in agitation.

But at last the motion has been transmitted to the cells (*b*) in the cortex of the brain, and now for the first time color arises, and the sensation of blueness (*b*) is excited. The observer looking through the microscope is conscious of blueness; but now an artificial device comes into play, and the observer says that the molecule of protoplasm *a* is blue. But we see at once that this is only an artifice, the reasons for which we will not inquire into. It is a fact that the blueness is only in the mind of the observer, not in the molecule in the brain of A. But how about the other properties of this molecule? How about the shape? A moment's reflection will show you that this too exists only in the mind of the observer, and is produced there by rays of undulations of ether being transmitted from every point of the molecule and falling upon the retina, exciting there again, as with color, vibrations among the molecules of the optic nerve. As before no picture of the molecule has yet arisen, nor does it arise till the motions in the nerve have been communicated to the cells of the cortex, when for the first time a picture (*b*) of the molecule, consisting of the

outline and surface of an octagonal figure, is formed. What is true of color and shape, is also true for hardness and the other qualities possessed by the molecule. Hardness is only a sensation derived by touch, and also has its origin in the mind of the observer. But after we have abstracted these qualities from the molecule, what remains? That there is something there which excites these sensations in us there can be no doubt. Something remains behind. What it is we do not know. But there is something there; some unknown force or activity you may call it, but its nature is unknown. This unknown something we call the *Reality* of the molecule, because it is the molecule as it really exists independent of the sensations of color, etc., it excites in us. It is called the molecule-in-itself, or the Reality. I want you to bear in mind what I have endeavored to explain is meant by the Reality of the molecule, in order that what will follow may be understood.

We must still go one step further. We have learnt what is meant by molecules. We have learnt that the Realities of molecules are unknown "forces."

You will remember it was said that when the molecules in the cells in the temporal convolution were set into vibration, one with another, the sound of a word arose in consciousness. Now what is meant by "vibration of molecules"? To answer this we must again turn to physiology. Turning again to our diagram it will be perceived that just as the *color* of a molecule exists only in the mind of the observer (B), so the *vibration* of these molecules is likewise only a sensation, and this sensation also occurs in the observer's mind, when he brings his microscope to bear on the cells in the convolution. This sensation, called a vibration, does not occur in the temporal convolution of A, but in the second person's mind (B). It is excited in B by something that occurs in A, just as the sensation blue is excited by that something called the Reality of the molecule. What

is this something which creates in the observer the sensation of molecular undulations? This in turn is the *Reality of the undulations.*

Now the nature of the Reality of the molecule we admitted was unknown to us; is the Reality of the undulation of the molecules also unknown to us? My answer is, No. It is known to us. What is it, then? *It is the word-sound* we have been in search of. The conscious state which we call the sound of a word is the Reality of the vibration of the molecules in the cells of the first temporal convolution. Such is the explanation which I desire to present to you. The data upon which this conclusion rests I cannot enter into here. I have already done so at length in another place, and must refer such of you as desire the proofs of this assertion to that work.[1]

My intention is to offer you that explanation which in my judgment best explains how it is that word deafness results when the first temporal convolution is destroyed. When this injury is inflicted, then the molecular vibrations, and of course the realities of these vibrations, cannot occur.

Those of you who have followed me thus far must have already perceived that the explanation, which I have endeavored to make clear, is not limited to the single question of aphasia, but is far more wide-reaching and general in its principles. It embraces the great question of the relation of the mind to the brain and explains their connection. It shows how consciousness arises, as the resultant of material factors, and how an impairment of the cerebral functions means also an impairment of consciousness. It shows how the physiological activity of the brain and consciousness are one and the same thing, and that any imperfection in the physical working of the former means an imperfection of the mind, and an imperfection of the mind means an imperfection of

[1] The Nature of Mind and Human Automatism. J. B. Lippincott Co., 1885.

the brain. We may say with certainty that wherever we meet with an impaired mind, whether that impairment be either only temporary or permanent, there is also some derangement in the physiological working of the brain. This theory therefore assumes a practical value. Some may be disposed to think that though we may have found a mode of explaining the relationship between the mind and the brain, still it is only a theoretical question without practical utility. To this I wish to make emphatic objection. In the first place it is a *physiological* question, and therefore one the elucidation of which enables us to understand the modus operandi by which disease of the brain is manifested in a disordered mind; and anything which does this must aid us in the comprehension of mental pathology. In proof of this I have only to allude to the general ideas widely prevailing regarding certain functional diseases, such as hysteria.

In former times, not so very many centuries ago either, the unfortunate person afflicted with insanity was said to be possessed with an evil spirit, and was loaded with chains, cast into a cell, and sometimes punished with tortures, that the evil one might be driven out. Improved knowledge in physiology and pathology of the body has resulted in the scientific and humane treatment of the present day. But something of the old ideas still cling to hysteria. An invalid, usually a woman, complains of pain, of suffering, of disordered functions of every form. Her character and disposition are changed from what they were. A physician examines her, finds no coarse anatomical lesion to account for the symptoms, and turns away with the remark "It is only hysteria." The patient says she is in pain. The physician says again, sometimes contemptuously, "it is only hysterical." And every one around the patient says nothing is the matter. How different all this becomes when we regard every symptom, even the thought which prompts a patient

to exaggerate her symptoms, as synonymous with disordered physiological activity! If we bear in mind that every symptom in functional diseases of the nervous system means disordered activity of the cells and fibres; that every deviation in the mental activity of the patient, every change of disposition and character, even the absence as well as the presence of former modes of thought, means an imperfect working of the brain, whether by the inactivity of some cells or the too great excitation of others, we shall better comprehend the pathological condition of our patient.

If space permitted it would be interesting to notice how this conception of the mind and the brain makes thoroughly comprehensible many facts hitherto inexplicable and often regarded as mysterious; facts which because inexplicable are oftentimes received with credulity. I refer to the influence of the mind upon the body both in health and disease. The influence of the mind in modifying the physiological processes of the body is a well-known fact; that it can also modify pathological processes of minor grades is a fact which, though tardily acknowledged by the profession, is from time to time made use of by empirics and impostors for their own material advantage. The well-known metallic points of Perkins, which nearly one hundred years ago reaped such golden harvests, and which now adorn the walls of our medical library, as a reminder not less of the power of the mind over bodily processes than of the credulity of human nature; the bread pills of our fathers; the placebos of modern medicine and the epidemic mind-cure of to-day, which like the dancing mania of the middle ages threatens to entice the whole population into its folds, all attest the power of the mind upon the body. A knowledge of the nature of the mind and its relation to the body allows the intelligent physician to distinguish the true from the false; to extend the boundaries of mental action to the farthest limit of its own domain, as well as to set restrictions to its encroachments made by shallow and credulous believers.

In attempting to elucidate the connection between aphasia and the anatomical lesion of the brain, I have thought that the time has come when the physician should not limit his investigations to mere broken fibres and degenerated cells on the one hand, nor to mental symptoms alone on the other, but should ask the nature of the bond between them.

Massachusetts Medical Society.

SHATTUCK PRIZE.

THE Committee on Publications are authorized to offer a prize of one thousand dollars for an essay, worthy of a prize, on The Climate and its Modifications as Influencing Health and Disease, or on any of the Diseases of the Inhabitants of New England, or on any kindred subject. Essays, each with a sealed envelope containing the author's name, must be delivered to the Chairman of the Committee on Publications on or before March 1, 1888. The name of the successful competitor, if such there be, will be announced at the annual meeting of the Society in 1888.

Any clew by which its authorship is made known to the Committee will debar an essay from competition.

Tuckerman

ARTICLE XXVI.

THE ANNUAL DISCOURSE.

UNDERCURRENTS OF MODERN MEDICINE.

By RICHARD M. HODGES, M.D.
OF BOSTON.

DELIVERED JUNE 9, 1886.

NOTE.—At an Adjourned Meeting of the Mass. Medical Society, held Oct. 3, 1860, it was

Resolved, "That the Massachusetts Medical Society hereby declares that it does not consider itself as having endorsed or censured the opinions in former published Annual Discourses, nor will it hold itself responsible for any opinions or sentiments advanced in any future similar discourses."

Resolved, "That the Committee on Publication be directed to print a statement to that effect at the commencement of each Annual Discourse which may hereafter be published."

UNDERCURRENTS OF MODERN MEDICINE.[1]

MR. PRESIDENT AND FELLOWS
OF THE MASSACHUSETTS MEDICAL SOCIETY:

NOT longer ago than when this Society was founded, the element of mystery, and the spirit of credulity, pervaded medical knowledge so intimately, that escape from their sinister influences seemed almost hopeless. From that day to the present time, however, there has been a perpetual, and still unceasing effort, to enlighten ignorance, and to interpret obscurity. Science has sorely shaken the foundations of many time-honored delusions. The complex causes and entangled results, which medicine attempts to regulate, have been so unravelled, analyzed, and illumined, that we already look back on an era of unexpected progress. Exact observation has taken the place of speculation and pseudo-philosophic discussion. Predictions can be made, without the shadow of doubt, that definite consequences will follow a

[1] The following pages, prepared to be read aloud, must not assume a printed form without an avowal of the writer's indebtedness to a greater number of articles and individuals, than the absence of quotation marks, or references, might imply. An endeavor to acknowledge this obligation has been attempted in an Appendix.

given lesion. There are maladies which can be prevented, or stamped out, as surely as the waters of a stream can be dammed by the engineer. Apparent inconsistencies,—such as the good health of persons who work in the midst of filth and offensive effluvia, and the impunity with which diluted sewage may be drunk,—are accepted as illustrations of our ignorance, rather than of the variability of natural laws. Theories which are only probable, and opinions based on mere authority, meet with little approval. The observations even of competent judges, are distrusted until they have been verified by others. Tradition obtains scarcely the homage of a respectful attention.

The exercise of a profession like that of medicine, —which, in its working capacity, enters every family, and is brought into relation with the weaknesses, as well as with the ambitions of mankind, —demands not merely a learned knowledge of health and disease, but requires comprehensive familiarity with modern civilized life, executive skill, and business habits, not inferior to those exacted by other technical occupations. Although the public is incompetent to determine the presence or the absence of scientific acquirements, it recognizes practical efficiency by many outward and visible signs. Education does not always carry with it the external indications which catch the fancy, and prove most acceptable to those who seek for counsel and assistance; but bearing and

demeanor, while they hide as often as they reveal the actual traits of an individual, are almost invariably the secrets of his failure or of his success.

The physician, therefore, who aims at a prosperous practice,—accepting the fact, that his personal and domestic joys are at the mercy of a bell,—holds himself in good-humored readiness to meet the unreasonable, as well as the reasonable, exactions of all classes of people. He remains stoically indifferent, if need be, alike to sewing-circle animosity and admiration. He listens with the attention, which is readily mistaken for professional interest, to incessant and repetitious accounts of bygone maladies. Blessed with the magnetism of a calm deliberation of manner, and by that kindliness which enables him to put questions sympathetically, he perceives intuitively the kind of advice his patient desires, and a judicious response lies in wait for every complaint and inquiry. Familiar with, and believing in the latest materia medica, he promotes their recovery by carrying his patients with him in the sanguine conviction that all their favorable symptoms are connected with his treatment.

While far from being a high type of his profession, such a man, nevertheless, possesses superior qualifications for usefulness. He has the tact, and a ready appreciation of the effect words can produce, which make him a sort of infallible Pope with the victims of insignificant ailments, —ailments which can be easily inflated into per-

versions of health apparently so serious as to require perpetual attendance. He will endear himself to the deluded invalids, to whom sympathy is such a luxury that they cannot allow themselves even the semblance of recovery; to the middle-aged spinsters who delight in superfluous measures; to the mothers whose children rule the house; and to the credulous men and women who take medicine from force of habit, or for the want of some other engrossing occupation. More than all, because justly, he will be gratefully esteemed by a large and intelligent clientage, to whom his pleasant visits, and placid mannerisms, carry genuine comfort and a full measure of satisfaction.

Masters of the highest arts of practice,—to whom mere popularity is of small account,—are rarely recruited from negative or effeminate men, or from those who are wanting in self-reliance. Strong qualities possess strong attractions, even if they also provoke strong dislikes. Defects stand out, and are more readily seen than virtues. Colleagues will not always sympathize with plain-spoken opinions that diseases, which have been developing for years, cannot be got rid of, like evil spirits, by the exorcism of some potent drug. Clients are not quick to agree, with Emerson, "that the laws of behavior must yield to the energy of the individual," or slow to be provoked by lack of patience, by indifference, or by brusqueness of manner, even when they merely indicate the friction which is generated in striving, by persuasion, to induce people to do their simple duty.

In every social grade, however, there are, invariably, those whom the individuality of some medical man will please. There are men and women who do not wish to be fussed over,—who simply desire to be painstakingly advised, and, if necessary, intelligently dosed. They are not allured by deferential and insinuating manners,—which, Mr. James says, can be traced back to the struggle for existence,—and they look indulgently upon faults, if, beneath them, they can detect that sense which is so rare, but which is nevertheless called *common* sense, and an honesty, frankness, and good judgment which invite confidence. They respect the disinterestedness which resolutely convinces people that they are well, when they only imagine themselves sick. They value the discernment which eliminates non-essentials, and which is ready to suspect that a patient has no disease to cure when he says he cannot take this or that medicine. They realize the value of reserve in social intercourse, and appreciate the brevity of speech,—or, even, the ill-concealed dislike to answer questions,—which is born of a belief that error lies in saying too much, rather than too little. Knowing their own ignorance of the manner in which a medical man must necessarily systematize his professional work, they see that he can, himself, best regulate the hour of his visits. Wisely perceiving that the interests of the practitioner are equally those of his patients, they willingly show consideration for the human nature which is in him, and, instead of dictating a

line of action, amiably concur with his better methods for their relief. Bearing in mind that they can do much for themselves, they illustrate by their conduct the truth of the observation, that "few cases are so hopeless as those which refuse to get well; none so hard to kill as the people determined not to die."

If the rivalry of a crowded profession sometimes tempts men to practise a certain degree of humbuggery in dealing with patients, there is rarely any association between profitable trickery and wilful quackery. Practitioners who please their clients are rarely incompetent, nor do they deserve to be called charlatans. They are not the knaves whose fatal ignorance accentuates and fosters the philanthropic proposition that the State should protect the community from medical imposition.

The fact must be surely though sadly recognized, that the practice of medicine, by people who have not the appropriate knowledge for what they undertake, cannot be prevented by legislation. It is one of the peculiarities of our civilized life that natural bone-setters, mediums, magnetisers, Christian scientists, mind curers, faith healers,—personifying all degrees and kinds of presumption, fanaticism, and ignorance, with motives ranging all the way from rapacious money-extortion to well-meant but mischievous meddlesomeness,—find a foothold and a following, alike in Paris and Pocasset. Such pretenders never have been, and it is not likely that they ever will be, thwarted or

controlled by statutory enactments. If we could prohibit practice by those who publicly proclaim their clap-trap, we should still leave unsuppressed another class, whose readiness to assume responsibility in sickness is equally devoid of any educated qualification. "The grandmothers, mothers-in-law, maiden aunts, and neighbors, whose chief delight lies in the administration of the subordinate provinces of domestic medicine, are past computation; and one shudders to think what might happen if, even as a single result, their energies were turned from this innocuous if not beneficent channel by the strong arm of the law."[1]

Interference with a man's choice of medical treatment may be a violation of the "liberty of the subject;" but not on that account do I venture to express the belief that the public should be left to care for itself,—in this respect, as well as in most other matters. It is a dangerous experiment to meddle with the relations of the public and a profession. In any attempt to modify the attitude of those whose rightful privilege it is to treat human diseases with absolute freedom from restraint, it should be remembered how wisely it has been remarked, that "Science commits suicide when she adopts a creed." The saying will prove equally true of medicine, when, by legislation, different medical sects are recognized, even to gain a worthy end.

If the Commonwealth is to be asked to take a hand in medical affairs, the appeal should be

[1] Mr. Huxley.

made solely upon the ground that, as the State employs medical men for certain purposes, it may properly be asked to define the conditions on which it will accept service. It is for the good of the community that nobody should die without an official record of the cause of death; that in both civil and criminal cases the law should be able to summon persons whose evidence may be accepted as expert. A petition that the State shall declare how and from what sources such general services may be received, and who shall be allowed to fill the medical offices of its military and other public institutions, is a request to its law-makers in which all could harmoniously join. An enactment covering a reply to this inquiry should constitute the whole of the State regulation of medicine.

The profession, and not the State, must be the guardian of its own interests. "No elaborate law," says Virchow, in a recent utterance, "no code of ethics, will of itself serve to instil self-respect into the minds of those to whom it appeals, or to keep in check the overwhelming desire of notoriety by which the less scrupulous members of our honorable profession are too often actuated."[1]

No safeguard can ever entirely prevent the fatal mistakes and accidents of both druggists and physicians, which arise from imperfectly written prescriptions, or carelessness in the handling of medicines. The business of the druggist is a large and important industry, demanding the best intel-

[1] Med. Times, Nov. 7, 1885, p. 633.

ligence, and nothing should be done to impair its efficiency. It is remarkable that grave errors are not more frequently made. Every physician has had reason, probably on more than one occasion, to thank the acute oversight and the good judgment of some careful apothecary, for the detection and sagacious counteraction of blunders in prescription-writing. As the dealer in medicines bears the burden of this important supervision, let him not be condemned if he occasionally prescribes chalk-mixture, or bromide of potass, over his counter.

It is the prerogative of this Society,—indeed, it is the great purpose of its existence,—to educate public opinion, and to promote and disseminate such knowledge as will make medical legislation, if there is to be any, not only well-advised and enlightened, but serviceable to the community rather than to individuals.

Nothing has better illustrated the influence of an Association like ours, than its effective support of the concurrent public sentiment, which helped to bring about the demission of the Coroner, and the accession of the Medical Examiner. A reform in the existing method of obtaining what is called expert testimony, would equally redound to the credit of this Society, if it were procured by its aid and coöperation.

Judges, juries, experts themselves, alike condemn the manner in which medical evidence is, at present, admitted in the trial of civil and criminal

cases. Recently, in this city, a jury, immediately on retiring, decided to throw out all the medical testimony presented for their consideration. The revision of a mode of procedure,—acknowledged to be defective, and for the faults of which a whole profession is disparaged and ridiculed,—ought not to be found difficult, when a tried system, in Germany, and elsewhere in Europe, has shown how much more wisely than by us the matter of expert testimony may be managed.

Unhappily it is not always the aim of litigation to arrive at the intrinsic truth; and the objection of lawyers to legislation which, with the intention of securing only the best quality of evidence, shall take from them the choice of their experts, and place it in the hands of the courts, grows out of a fear that witnesses, so chosen, might be too much imbued by a desire to substantiate the truth, and the truth only, to meet the wishes of those whose aim is simply to win their cases.

Justice is at a great disadvantage when there is no certainty that real experts are called by either party to a suit,—no assurance that their non-expertness will be shown up, if it exists,—and not always the conviction that they will testify without regard to the side which has summoned them. Counsel cannot be expected deliberately to call witnesses who would certainly, or even possibly, damage the cause of their clients.

That even direct medical evidence should possess value, witnesses must be held responsible for what they say or state. Their trustworthiness, and the

relevancy of any evidence given, can be thus controlled only when it is uttered in the presence of an *amicus curiæ*, competent to recognize the ignoramus or the pretender by his testimony, and to keep both court and jury from being led astray by side issues, or blinded by irrelevant talk, or deceived by the advancement of theories, which, though they may be true, are presented in a partial, an imperfect, or an exaggerated manner.

The conclusion, therefore, is a growing one, that the appointment of experts, in our Commonwealth at least, ought to be made a part of the judicial function, and that their compensation should be fixed by statute, or by the court, and be paid out of the public treasury. By the adoption of such a plan, court-rooms would be relieved of exhibitions which are frequently discreditable and mortifying; and a recent action by the Bar Association of the City of Boston, encourages the hope that this reformation, which so distinctly concerns the dignity and the welfare of two great professions, will not be indefinitely delayed.[1]

The tenor of a physician's intellectual way of life follows the border lines of science, and leads him to breathe the atmosphere, at least, of learning. Wherever, and however, his lot may be cast, it devolves on him to maintain and promote some of the truths most important to humanity. Towns and rural villages, far and near, are, fortunately, not without the practitioners who do their own think-

[1] Appendix I.

ing, who are good observers, broad in their views, abundant in knowledge, efficient in emergencies, —equals in ability to those whose city life may have given them greater opportunities,—and full of the salutary influences which sound opinions, and a high moral tone, exercise among all classes of society.

The art possessed by bees, of producing at will an individual with the requisite qualities for supremacy, has not, however, been acquired by mankind. Men become wise and learned, rather by the strength of their special inclinations, than by the compulsory stimulus of educational expedients. Personal ability, personal energy, peculiar tastes and habits of mind, are qualities which are growing in general estimation; and the opportunity for the exercise of exceptional talents and attainments increases with the growth of population and the material welfare of the country. In no profession is there a more fertile field for turning to account a great variety of accomplishments than in that of Medicine; nor is there one in which the demand is so constant for strength of character, and for intellectual capacity above the average.

The fact that preliminary education is unsatisfactory and defective, and that the study of medicine is consequently begun at too low a point, creates a generally accepted conviction that the time devoted to it by medical schools is insufficient; and yet the practical necessities of a large majority of young men prevent the prolongation of professional training, because this would advance their

graduating age. In England the student of the present day enters his hospital as a boy of about eighteen years of age; and it is declared hopeless to think of extending the term of pupilage,—for the average medical practitioner, at any rate,—beyond the age of twenty-two. In our own country a still earlier maturity not only exists, but is expected. In spite of this, however, the average age of graduation in the Harvard Medical School is more than twenty-four years and a half. A system which matures its fruit so tardily must tend to make educational institutions for the few, rather than the many. This would not be a regrettable consequence if it were the ultimate object of medical teaching to turn every student into a professor, or if a special degree of Doctor Scientiæ Medicinæ, with all that the title implies, were the outgrowth of such a tendency.

There is but one remedy for too short a course of study,—which might be judiciously though not easily extended,—and for graduating at an age which is too old,—and that is to lengthen the curriculum backwards into the preparatory years by requiring better qualifications to begin with.

The well-deserved reputation of the Harvard Medical School,—largely added to by its early abandonment of traditional and imperfect methods of instruction,—is still maintained by the energy and enterprise of a Faculty, many of whose members, practically, give their whole time to teaching. Acknowledged to be a source of pride by the profession throughout the country,—by the city in

which it has its home,—and by a community which has always greatly respected the calling of medicine,—it will be in no censorious spirit that I allude to two or three points of interest, having reference to still further improvement in the educational system of a school upon which this Society's usefulness preëminently depends.

Admission to the Harvard Medical School now requires the applicant to pass a "satisfactory examination in English, Latin, and Physics, and some one of the elective subjects, Botany, French, German, the elements of Algebra, or of Plane Geometry." If, instead of this, a knowledge were alone demanded of the elementary but comprehensive principles governing the action of living things, and which are the substrata of human anatomy and pathology, a great gain would be made. The familiarity of students with Natural Science, especially Physiology and Biology, and the manner in which they pass their examination therein, might easily decide, not only the fitness of candidates to begin the study of medicine, but also test their proficiency in English and classical subjects.

It was the great aim of Professor Agassiz, here, as it has been of Professor Huxley, in England, to make young people good observers, and to convince them that attention, memory, and observation are not only serviceable and remunerative, but always attainable. It should be a chief endeavor of any instruction intended to precede that of a medical school, to cultivate the tactile, visual, and auditory

senses, and to beget an early conviction of the value of precision.

Studies, therefore, which involve the logic of actual facts can only be pursued to advantage where they are taught practically, and with a thoroughness which precludes the possibility of cramming. They must be made relevant to, and in harmony with, the subsequent education which (it is complained) now usurps too much time, and is needlessly difficult, because previous discipline has so little prepared a ground-work for its reception.

Schoolmasters may say that it is waste of time to teach science as they are compelled to teach it; but the means of carrying into effect some plan of primary scientific schooling can surely be perfected, if it is called for; and if details interpose obstacles, patience and experience must overcome them. Eventually such instruction will be organized as well as,—better than, I trust,—classical teaching has been hitherto, and High Schools, at least in all cities and large towns, will become competent to fit young men for the study of medicine. The practical character of the age is gradually eliminating from education many of the special processes by which the intellect was formerly developed. Various kinds of laboratory and experimental work in physics are already urged upon all,—and adopted by some,—preparatory schools, as optional for pupils to whom a large amount of Latin and Greek does not offer the intellectual

discipline or equipment which they are aiming to obtain.[1]

Harvard University is active in the effort to make natural science an attainable and profitable study. In the interest of those intending to become medical students, electives in Anatomy and Physiology have been asked for in its academical department. The Massachusetts Institute of Technology, and the Johns Hopkins University, have already established courses introductory to the study of medicine. These are wise, tentative endeavors,—even if rudimental and inadequate,—to provide instruction which shall save, by anticipation, much of the labor,—and, therefore, much of the time,—now connected with the acquirement of a professional education.

I cannot but think that compulsory attendance on the same course of instruction, for two or three successive years, would be an advantage in certain branches of study, and above all in Anatomy; because, from beginning to end, Anatomy consists of intricate details. These are difficult to grasp mentally. Many require to be memorized, and the knowledge of them is worthless if not exact.

Furthermore, if the studies of Anatomy, Physiology, and Therapeutics could be arranged with maximum and minimum requirements, the separate grades into which students are inevitably divided would find the measures of their differing capacity

[1] "Jesse Foot accuses me," said John Hunter, "of not knowing the dead languages; but I could teach him that on the dead body which he never knew, dead or living."

better filled. Time and money could be expended to more permanent advantage if there were both prescribed and elective courses in each of these departments, in place of the present exaction of equal and uniform proficiency from all pupils. The aims of individual ambition would also be more securely gratified; and the hours available for obtaining practical acquaintance with the phenomena of disease, or for special subjects of study, both by teachers and advanced pupils, would be supplemented to an extent not heretofore possible.

In this connection I venture to suggest that, if examinations should attack learning less on its intellectual side and more on its practical side,—as might be the case if they were not so generally conducted in writing,—knowledge would still be as exact, while the examinations themselves would not be the educational regulators (it might almost be said the despots) they now are. Though we may not follow the example of universities under other surroundings, and adapted to other needs, we can still adopt the business methods of American requirements, without lowering the standard of liberal and productive scholarship.

I have no hesitation in saying that teaching of medicine and surgery by set lectures only, or even largely, is unsuited to the wants of learners, and is already recognized as antiquated. To justify this assertion I need but refer to the sentiment of medical teachers in London, and to the comparable illustration which is furnished by the Law School at Cambridge. The disappearance of systematic di-

dactic lecturing, and the substitution of corresponding tutorial instruction,—if the difficulty as to the number of teachers and the expense of such a system could be met,—would be, radical as it seems, a most progressive step in education. Books and lectures may make scholars, but not practical physicians. American students add to their course of study a year in Europe,—not because the hospitals are larger, or the knowledge of teachers greater than in their own country,—but because, in small classes, under the immediate guidance of a first-class instructor, they can see and demonstrate every fact for themselves.

The existence,—side by side with its University Faculty,—of what is called an Extra-Mural Medical School, accounts in great measure for the attraction which Edinburgh has offered to students of Great Britain during recent years. The generous rivalry, which the tutorial character of such a school generates, cannot but inspirit the neighboring university; and it should be realized in America, as it is in Scotland,—and as it also is in France, in the *enseignement libre* of its *Ecoles Pratiques*,—that no policy could be more short-sighted than to discourage competitive teaching which exercises so healthy a stimulus, or to restrain pupils from obtaining, wherever they may think their interests are best met, that instruction which is to carry them through their examinations.[1]

There are misgivings here,—and they are equally strong elsewhere,—as to the influence upon the

[1] Appendix II.

practical education of young men which is exerted by the Training Schools for Nurses, now so popular and so numerous.

An interested and superior class of young women, who bring great enthusiasm to their work, are instructed, by teachers of the highest grade, in Anatomy, Physiology, the Theory of Wounds and their antiseptic treatment, Fractures and the use of Splints, and Bandaging, in all its refinement. They are taught how to observe symptoms, count pulses, take the temperature, judge of doses, if not of drugs, and to prepare systematic written reports of cases. Purely medical subjects, such as Dropsy, Rheumatism, Erysipelas, Gangrene, and Diseases of the Eye, are included in the list of lectures given at one of the oldest of these institutions.

Many of the duties which are now delegated to nurses in the wards of the hospitals where they obtain their training, are such as physicians have heretofore attended to personally. In private practice they are encouraged to regard certain details of domestic labor, on which the welfare of the sick depends in no small degree, as menial, or inconsistent with the "elevation of their calling." Their social status in the family by whom they are employed, is a constant source of trouble. Practical experience leads many to the conclusion, that as a nurse advances in special knowledge she proportionately retrogrades in the efficient discharge of the minor duties and drudgery, which, after all, are the chief requirements of her occupation.

Experienced training-school pupils become so familiar with many manipulations and points of practice, that hospital students give way to them, partly from a too common *vis inertiæ*, and partly from a fear of showing themselves less skilful; but, more than all, from the idea that time cannot be profitably spent in learning the minutiæ which belong to the subordinate occupation of nursing. Nor is this impression confined exclusively to hospital pupils, or those interested especially in surgery. It extends unwittingly to students of all degrees and preferences, in and out of hospitals, and to physicians as well. Dependence on nurses for information about the patients "under their care" (as they say), blunts the young practitioner's own observation, lessens his attention to particulars, and deprives him of the experience and the education which come by doing things for one's self.

There is no reason why a nurse should not be interested in purely medical subjects. Her experience is of the same kind as that of the physician,—in certain cases even greater in its opportunities,—and it is too much to ask that she should pay no attention to the medical aspects of disease; but the fact must not be lost sight of, that, at the present time, intelligent women have the choice before them of being either nurses or doctors, and that they cannot be both.

The needs of sick people, so far as the requirements of the sick room are concerned, are of a nature which women alone can satisfy. The present system has been brought about by the aid,

if not at the instigation, of physicians. Admirable in many ways as its results are; greatly as trained nurses contribute to the comfort of patients, physicians, and families; in spite of the fact that nursing takes a higher stand, for the very reason that drugs, outside of a few specifics, are less and less depended upon,—it would be a misfortune if the existing method of teaching nurses should tend to lift them out of a position,—servant-like though it must be in many respects,—which it is a womanly privilege to fill, and one not unworthy of female ambition. It would be still more deplorable if their training should bring female nurses into collision with physicians, either of their own or of the other sex; or if, by their too near approach to the same lines of study, the zeal of medical students should be diminished. Worst of all misfortunes would be the creation of an unexpected hybrid, neither servant, nurse, nor doctor.[1]

I have already expressed the opinion that a man should be scientific in thought and purpose when he *begins* the study of his profession, or there is small chance of his ever becoming so. No one, therefore, will suspect me of either indifference or doubt as to the value of sound medical learning.

The study of the phenomena of life,—and therein lies the whole of science, so far as the business which engages our attention is concerned,—has exercised a great influence in promoting truer estimates of disease and wiser methods of treat-

[1] Appendix III.

ment; but a just and natural proportion should be maintained between that part of our pursuit which is purely scientific and that which is practical. If one is in danger of being prosecuted at the expense of the other, it ought not to be the latter.

The lack of practical knowledge on the part of a physician, otherwise profoundly learned, may cause an immense amount of suffering. It may give an impetus to disastrous epidemics. Hesitancy to command the isolation of a single case of measles or scarlatina,—or delay in so doing,—subjects a family, a school, or a community, to the peril of an epidemic more dangerous than the small-pox. Dirty finger-nails may communicate a fatal poison, through the trivial operations of surgery which every physician undertakes to perform, or inaugurate the "private pestilence" which still sometimes follows in the track of the obstetrician. The increasing frequency of non-union in fractures, if I can trust my own observation, shows that they are not so skilfully treated as formerly. The acne of an emigrant, it is said, has quarantined an ocean passenger-steamer. Within the past year, in a town with the organization, resources, and appliances of 8000 inhabitants and 13 physicians, an outbreak of typhoid fever reached the extraordinary proportion of 1200 cases in one month, 500 occurring within the first ten days after its irruption. Through this outbreak 300 families were made dependent on charity at one time, and 107 lives were sacrificed. The extra expenditure by the sufferers was $60,000, besides an equal

amount lost in wages through enforced idleness. Beginning with a single typhoid patient, whose accumulated evacuations suddenly gained access to the town's aqueduct, the germs of disease were disseminated with great rapidity along the line of water distribution; but the differences of medical opinion, as to the origin of the trouble, were at first so great that no prompt restrictions were placed upon the use of the drinking-water, though it was suspected from the outset of being the medium of conveyance for this terrible affliction, ending in such unnecessary loss of life. Subsequent developments proved the suspicion to be well founded, and the large number of suits brought against the water-company by the relatives of those who died, indicates the prevalent impression that this epidemic might have been prevented by proper vigilance.[1]

Ignorance of certain groups of diseases is acknowledged and confessed by every honest physician. The rapid accumulation of facts in all departments of medical research is beyond the comprehensiveness of a single mental grasp. There are anatomists and physiologists who have never set foot within a hospital. The International Medical Congress, with its twenty or more sections, is an illustration, as well as a recognition, of distinct demarcation in the lines of professional study.

Almost without exception, such sub-divisions are concessions to convenience, and owe their exist-

[1] Appendix IV.

ence largely, and perchance unfortunately, to considerations connected with the treatment of disease. In nearly every instance they represent departments of operative surgery, in which particular skill or special manipulations are required; and their technical element, often reaching the highest refinement, has exercised a great influence in advancing the art of medicine. But they have also abetted a mistaken tendency of public belief, that elaborate division of labor must necessarily be as useful and successful in a learned profession, as it is in the mechanic arts.

Old fashioned practice,—that is to say, the practice of thirty or forty years ago,—looked on specialism as an innovation of doubtful respectability. Sick people were then regarded as private property, and poachers were punished if they intruded on personal preserves. To-day the assumed right to deal exclusively with the diseases of definite parts of the body,—generally those beyond the sick man's own range of vision,—is no longer regarded as a personal presumption, or as a violation of ethical rules. Patients, even, exercise the prerogative to be their own judges, both as to the nature of the particular disorder from which they think they suffer, and of the remedy it requires.

It is also asserted that the empire of the general physician and surgeon is crumbling away, and that his dirge is being chanted. The *personnel* of a general practice is said to change entirely in about the same time which it is popularly supposed to take for the renewal of the combined atoms of

the human body; and the family doctor,—once a fixed and immutable institution,—finds it his office, now-a-days (it is cynically declared), solely to decide what specialist shall be summoned, and must count himself highly favored if subsequently invited to listen to the opinion obtained, or lend his assent to the treatment prescribed. "Specialism," we are told, by its recent vindicator, "being a movement founded on the true principle of progress, and in harmony with the general 'stream of tendency' in these days, will gain strength and volume as it advances, sweeping away, in its victorious current, all the rubbish of pedantic prejudice and malicious bigotry that formerly defiled its waters, and hindered their flow."

There can be no denial of the fact, that whoever, in addition to his general acquirements, knows more about some particular thing than any one else,—or at any rate can do some special work preëminently well,—has a decided advantage over his fellows; but the suggestion that all diseases of the body, and not merely those of its inlets and outlets,—even though they are beyond the reach of mirrors, aspirators, or sounds,—must be put in the same category with ailments of throats and ears, and reveal their secrets hereafter only to the sharp observation and skilled insight of specialists, is one which will hardly be conceded at present. With all the facts before them, enthusiastic students and workers still deliberately select the broad roads of general medicine and surgery, in preference to the narrow and possibly devious

paths of special practice, though the latter may lead to speedier pecuniary success.

The human body is made up of parts and functions so thoroughly inter-dependent that it cannot be parcelled out into defined and isolated regions. Let me illustrate this self-evident statement by quoting a post-mortem diagnosis, made by Professor Fitz, and taken absolutely at random from the Autopsy Book of the Massachusetts General Hospital. It reads as follows:—"Chronic Pneumonia; Suppurative Pyelitis; Chronic Perimetritis; Hæmatoma of Ovary; Ischio-rectal Abscess, with Perineal Fistula; Chronic Typhlitis, with pseudo Polypi; Gangrenous Ulceration of Vermiform Appendix; Granular Degeneration of Liver and Kidney." The patient, with this appalling pathological conglomerate as his record, was one who, if alive, would have sought the advice of a specialist in diseases of the chest, and none other.

Despite all arguments drawn from expediency, —despite the difficulties encountered in the mastery of details, by any physician who has not had a special training,—one such case as that just alluded to emphasizes an assertion which cannot be disputed, that he who has the most comprehensive knowledge of the human organism and its disorders is, with certain well recognized exceptions, best able to determine what is the matter with any given part of it, and so to help its unlucky owner to recovery, either through his own practical skill, or his ability wisely to select the colleague whose attainments may permit him to

deal better with the case than he can. This object will not be less readily achieved if the practitioner acknowledges the limitations of medicinal therapeutics; or believes in the maxim that "the best physician is he who can distinguish what he can do from what he cannot."

Greater refinement in the distribution of medical practice is not likely to carry its analytic tendency beyond the present separation of physicians into a few distinctive and somewhat inclusive classes, drawing from a common fountain of knowledge, and maintaining the integrity of their profession, by the essential identity of science in every department. Accurate and familiar acquaintance with the applied laws of the latest medical learning is, in these days, a part of the most limited professional outfit. The merest practitioner equips himself with this resource, in the same matter of fact way that he buys a thermometer or a stethoscope. Without it he can scarcely take part in the present competition for wealth, influence, position, and advancement. But skill in diagnosis is, and always will be, the essential feature of a physician's business. What is the matter with a patient is the fundamental problem which presents itself for his consideration, and the more he lays emphasis upon methods of treatment, the greater will be his danger of an approach toward empiricism. Increase of competition may place our successors under a mighty temptation to think, as the French epigram puts it, that "there are no such things as diseases, but only patients;" and

make them forget that medicine is a profession, not a trade. It is to be confidently hoped that the growing efficiency of medical education, with its broad and intelligent training, will encourage a higher standard of self-respect than is implied in such a misgiving.[1]

The knowledge accumulated by medical science has far outrun the capabilities of remedial art, in its adaptation to practical use. When we venture into the domain of medical and surgical treatment, the foreboding signs of ignorance and inexactitude are betrayed. The discouraging absence of sure measures of relief, when the hope of alleviation is strongest, only reveals the paucity of our resources, and the disproportion between the natural stimulus towards action which is instinctively aroused by the presence of sickness and suffering, and the lack of means to act efficiently. The impulse and provocation to "do something" are too apt to instigate a pretence of knowledge, or to prompt an audacious, irrational, or trifling interference, which subverts comfort but does not cure disease. This anxiety incites us to unavailing prescriptions and modes of procedure, which, worthless as they are, pass into such general use that even the most conservative sometimes accept them as articles of faith, scarcely admitting of question.

Therapeutics, when not guided by an intelligent and definite purpose, are superfluous and meddlesome. Surgical operations, which, from the out-

[1] Appendix V.

set, it is known cannot be completed, and into which every surgeon remembers with regret that he has been drawn by some vague expectation of benefit,—the infiltrating epitheliomata, the adherent and fatally located tumors, the malignant growths sure to return, the limbs crushed in railroad accidents, from which he has not withheld his hand,—have certainly contributed nothing to the self-satisfaction of the operator, or helped to advance even the purely mechanical part of surgery.[1]

Prurigo secandi is a malady as obsolete as its designation; and the anxiety to attach one's name to a new instrument, or to identify it with some ingenious surgical device, is not a proclivity of the present generation. It was formerly thought the height of anatomical and operative skill to reach the almost inaccessible foci of certain cranial neuralgias. The undeveloped and atrophied muscles of cleft palates were once, with infinite pains, unrequitedly sewed together. Varices of the legs, and varicoceles, were operated on. Tonsils were cut off with fabulous frequency. Tenotomy was uselessly practised. Diseased joints, which time and immobility would have cured, were amputated or excised. The operation for cancer of the breast was as habitual as it is now exceptional,—or, at least, as it soon will be.[2]

The aim and endeavor of the present day is to perfect preventive and prohibitory measures, which

[1] Lancet, March 21, 1885, p. 527.
[2] Appendix VI.

shall exclude or annihilate disease; which shall render many surgical operations unnecessary, or, when inevitable, shall eliminate from them the extraneous and accidental complications, which not only check the processes of recovery, but imperil life itself. The success of these efforts has rescued our labors from the domain of chance; and favorable results are ensured, in medicine as well as in surgery, under circumstances which were, heretofore, invariably attended by failure.

It seems incredible that members of the profession should have been cautioned, as they were when I was a student, against being "dazzled by the alleged success of ovariotomy;" or that a distinguished editor should have declared, that "a fundamental principle of medical morality is outraged whenever an operation so fearful in its nature is performed."[1]

The intimation that many causes of disease are to be found in the air, the water, the soil, or the food we eat, and the assurance that they are therefore controllable, has given activity to the study of hygiene, has made Health a department of the State, and has called into existence a new profession, that of the Sanitary Engineer. The novel problems presented for investigation by these multifarious suggestions are such as can be solved only by exact methods. Their intricacies are followed out in laboratories, with so much greater advantage than in hospitals and sick-rooms,

[1] British and Foreign Medical Review, Oct. 1843, p. 402.

that almost all modern medical knowledge, of which we are so justly proud, owes its existence to purely scientific workers.

The guesses of genius are said to be sometimes more valuable than the demonstrations of mediocrity. "Preconceived ideas, submitted to and controlled by severe experiment, are the vital flame of scientific observation."[1] They give purpose and direction to one's pursuit, and are the working hypotheses essential to the practical application of our knowledge.

One of the earliest verifications of the suspicion that living organisms might be a cause of infective disease, was the result of Pasteur's elaborate study of fermentation. This inquiry led the distinguished savant to surmise, and finally to determine absolutely, the microbial nature of a contagious malady of the silkworm, known by the name *pébrine,* which threatened to extinguish the entire silk-industry of Europe. The practical importance of these investigations, and their economic success, gave a great impetus to microscopic researches into the bacterial character of a large class of diseases, and led to the crucial method of their study by the artificial culture of micro-organisms. The significant issues of these experiments we are only now beginning to appreciate.

The whole order and sequence of facts in any discovery is rarely arrived at. Explanations are only partial, and danger lies in their acceptance as final. In the records of human investigation,

[1] Histoire d'un Savant par un Ignorant, p. 284.

however, it would not be easy to indicate measures of more promise,—even in their present state of incompleteness,—than the suggestions for the prevention and cure of disease, which the Germ-Theory has prompted in regard to tuberculosis, cholera, various zymoses, and malarias, as well as in connection with widespread and destructive affections of agricultural and industrial interests. It would be difficult, also, to name an expedient that has proved more humanely useful than the antiseptic practice, which saves life and limb by excluding germs from wounds, through the, now, almost universal adoption of rigid hygienic precautions, strict cleanliness, and thorough drainage.

It should not be forgotten that these contributions to human welfare have mostly come, as they only could come, from experiments on living animals. Neither should it pass unnoticed, that the knowledge of two remarkable facts in the economy of nature,—the invisible but perpetual ploughing of the soil by its living tenants, and the relation of germs to disease,—has been derived from the study of creatures seemingly so unimportant as the earthworm and the silkworm.

The success of intelligent effort to avert disease would not be fairly stated, without a distinct recognition of the fact that the alleviation of suffering,—in its restricted and individual sense,—is one of the constant accompaniments of this endeavor.

Pain has its uses. It obliges rest. To prevent pain, or to cure pain which exists, additional pain must not be caused. Infrequent handling and inspection are essential conditions of surgical antisepsis. Rest, physiological as well as mechanical,—which, always excepting anodynes and anæsthetics, implies a masterly inactivity so far as drugs are concerned,—constitutes an immense therapeutic power, fortunately extending itself, by the agency of more and more rational methods of treatment, throughout the whole field of modern medicine and surgery.

So long as the belief existed that pain was Divinely intended to be a chastising or an improving agent, harmonious and vigorous efforts for its permanent diminution, or for its complete removal, were not to be looked for. The introduction of anæsthesia, by the inhalation of ether, was retarded by such a superstition. The conviction was reached very slowly, especially in certain communities, that the time had come when it was the paramount duty of physicians,—always and everywhere,—to avail themselves of this agency for the prevention of suffering. The logic which converted dogmatists to the use of anæsthetics during child-birth, must force the acknowledgment that it applies equally to their employment under all circumstances of severe pain. There can be no longer a doubt of the abstract right to procure insensibility by the use of every accessible resource, whenever pain is constant or acute, and especially when it is associated with hopeless disease. Few

medical men, few patients or their friends, now shrink from the responsibility of such a procedure.

Recall the mortal injuries,—which so many of those here present have witnessed on the battle-field,—from wounds received under circumstances rendering the sufferer's removal impossible! What a blessing must have been the unstinted morphine which the humane surgeon left behind him, without questioning whether in so doing he shortened the few possible hours of existence that remained! Who does not give anodynes with a lavish hand in the last stages of cancer! Who will not unhesitatingly soothe the nights made restless by the exhaustion of lingering but certain dissolution! Continuous pain exhausts the physical forces. The life of the great General of our Civil War was not shortened, but prolonged,—as the "sealed doom" of many another has been,—by the comforting opiates which solaced the uncomplaining but limited days of his last few months.

If an individual suffers from incurable pain, except while under the influence of anæsthetics, it has been argued that,—with the concerted action of himself and friends, and the concurrence of two or three medical advisers,—and with the adoption of precautions similar to those provided for putting a lunatic under restraint,—it should be allowable to make such an anæsthesia complete and enduring. It is even claimed that a change in our laws which would permit this premature extinction of life,—in cases certain to end fatally, and liable to be accompanied to the end

with agony,—would produce "benefits simply enormous," and that nursing the hopelessly sick ought to be looked upon as a "nuisance and a danger." We are reminded that suicide, under the conditions assumed, is very leniently regarded by many, and perhaps encounters more sympathy than reprobation. As an escape from certain forms of shame and dishonor,—moral pains,—suicide has been defended as in the highest degree heroic. It is contended that such a "cure for incurables" in no wise conflicts with the sanctity of human life.

The impossibility of attaching any importance to the personal consent of a sufferer, or to the request of his friends under the circumstances supposed, need hardly be pointed out. The last stages of painful illness are, as a rule, less painful than those which precede. In itself the act of dying is probably painless. In terrible injuries, which are so often spoken of as illustrations of extreme suffering, shock benumbs the sensibility, and it is not always in our power to distinguish between those cases which are hopeless and those which are not. Recoveries, unexpected by experienced surgeons, follow the most extraordinary mutilations.

I entertain no fear,—because of the presumptive right to evade pain whenever evasion is possible, and endurance can do no good,—that physicians will, therefore, accept the sophistry which claims equally a right and privilege to deliberately relieve suffering by the permanent anæsthesia of death. It is a matter of fact that, whenever we please,

we can secure euthanasia without shortening life. The appliances and the resources for the alleviation of pain are many and efficient. The question of their practical or successful employment is no longer one of uncertainty. The universality of their adoption turns, not upon a point of morals, but upon considerations of public safety. These may safely be left to the wisdom, the integrity, and the conscience of the medical profession.[1]

Among the predominant causes of preventable disease in our own community there are two, exercising an influence in youthful life, and particularly among females, which are as universal as those of specific micro-organisms, and scarcely less pernicious. These are insufficient nourishment, and insufficient rest and repose, or, expressed in briefer terms, famishment and fatigue. To counteract these inimical influences is to control, to a great extent, the conditions of life,—especially of city life. It is an ambitious aim, but one which certainly comes within the scope of a physician's personal effort, if not within his professional province.

It is only of late years that the diet of those not actually sick has received the attention it deserved, either in its bearings upon the healthy growth of the human body, or its defensive power in relation to disease. The data supplied by physiology, the dietetic customs of social classes, the likes or dislikes of a physician's own palate, were, until

[1] Appendix VII.

recently, the guiding principles by which the alimental needs of physical economy have been regulated. The conflicting advice of medical men still betrays the absence of any unanimity of opinion on this question, considered from a therapeutic point of view, and there is no subject in which personal experience is more fallacious as a guide.[1]

It is a common remark that young people of the present day have poorer health than their fathers and mothers, and especially their remoter ancestors. At the period of adolescence, or before, many live at a rate, and under a pressure, the wear and tear of which average parents fail to appreciate; nor do they think of comparing the life which their children lead, with the calm and unexciting conventionalism of their own youthful days, or with what they may have heard described as the routine of their own parents. The "good old stock" of certain sleepy and quiet towns is often alluded to. Some of us, to a degree which another generation will never enjoy, are endowed with a vitality transmitted by the simple habits of the dwellers in the tranquil and well-to-do homesteads of an earlier day.

[1] Those who have read Sir Henry Thomson's interesting essays on food must not forget that his Lenten views have reference, chiefly, to the proper diet for advanced life, not for the growing years of youth. It is obvious that less nutriment is needed as vitality and activity diminish. It should also be borne in mind that the distinguished lithotritist, artist, and æsthete, is himself a Vegetarian. Notwithstanding this, he has a London reputation as the giver of exquisite dinners "graced by sound wine, judiciously chosen dishes, and easily amalgamating guests," always strictly limited in number to eight; and though absolutely a tee-totaller, he takes "the same sort of pride in his cellar which a scientific floriculturist might in his green-houses, though their contents never have a place in his drawing-room vases." [Nineteenth Century, 1885, p. 777. Society in London, p. 175.]

They grew up with no opportunity of being fastidious. They knew absolutely nothing about luxury, and had not too much of what we call "mere comfort." They had the "reg'lar" and solid meals at "noon-time," which are said to be the foundation of true stability of character, and they enjoyed at least nine hours of sleep every day. They developed into men who were rarely sick, and into women with strength enough to bear and rear large families. These women often possessed an intellectual vigor which inclined them to acquire a masculine education, as well as to devote themselves generously to social, charitable, and other womanly pleasures and duties.

Modern mothers little realize the "brain work" in amusements which, under the thin guise of their possible educational tendency, are made to justify late hours and stinted sleep for growing girls during their school-life; in their practice of music for which they have little capacity, and in which they take but a half-hearted interest; in studies at home, which go so against the intellectual grain, that lessons are imperfectly learned, and forgotten almost immediately; in irregular, prolonged, and motiveless afternoon walks, encouraged because the morning has been spent in-doors. The effect of this prodigal use of physical energy is to arrest the growth of their forces and faculties, to "knock out" of them the vital functions of eating, drinking and defecating, and to induce an amenorrhœa, whose redeeming feature is that it spares them the waste involved

in a monthly loss of blood. It is fatal if girls do too little, and it is disastrous if they do too much. To steer between these two opposing perils is so difficult a task, that the majority of parents end by letting go the helm, leaving the fragile vessel to guide itself, satisfied if they can secure a merely negative condition of health.

A justly distinguished master of the Girls' High and Normal School in this city is reported to have said, that a principal qualification for the office he held should be a good medical education. The first hour of his school day was spent in going from room to room, at the call of teachers, to see pupils who had fainted or vomited, or were in "spasms," in hysterics, or, in some other way, had come to a pass which alarmed the inexperienced. These phenomena he clearly recognized as due to fatigue, insufficient sleep, and the want of an adequate breakfast,—a meal which these girls were too tired to eat; or which they did not think worth wasting time upon, when home duties demanded their coöperation, a morning lesson was waiting to be looked over, or a neglected task to be made up, and a long walk intervened between their homes and the school.

The report of Sir James Crichton Browne, on Educational Overpressure in London, which attracted such universal attention two years ago, states that out of 6580 school-children examined, 3034, or more than 46 per cent., suffered from headache. He attributes this state of things largely to innutritious and insufficient food, and

takes pains to say that partial and occasional starvation is not confined to children of the lowest class.[1]

The inference from these statistical facts, or from a single teacher's experience, is not necessarily that school-taxes should be devoted to dispensing new milk rather than education, though they seem to hint that a part of the public money might thus be judiciously appropriated. The alleged overpressure in schools is, in the main, a fallacious assumption. Sound study is an advantage, if the general rules of health are attended to, and for one youthful person injured by excessive application, there are a hundred whose physical condition is deteriorated by want of wholesome mental exercise.

The special provocatives of "delicate health" in young females, are in great part social. The deleterious influences of a multiplicity of engagements, of the exacting demands of ambition, fashion, and gayety,—and not unfrequently of an early betrothal,—are intensified by the capacity for endurance which belongs to the so-called weaker sex. A girl can tire out her partners in the "German," one after another, and a feeble wife can carry her baby twice as long as her athletic husband. The more strain there is upon the strength of women, the more completely do they forget themselves and their material wants. They submit, and give no signs of their emotions, to the depressing influences of misfortune or

[1] Westminster Review, Jan. 1885, p. 12.

an unhappy home. They suffer and are silent, with what have been called "bad-husband headaches." They stifle a wounded pride which is deep in proportion to the smallness of the family income, and yield to the aggressive attacks of neurotic influences (the least wearing of which may be the mental), only when the limited energy their bodies possess is exhausted, and which, when once lost, they rarely have the physical capacity, or power of mechanism, to replace.

Even this limitation is trammelled and minimized by the tyranny of prevalent styles of dress. The displaced livers and spleens, furrowed by overlapping ribs, which are portrayed in dress-reform tracts, are not the features on which the imagination of young women should be invited to dwell, half so much as the compressed stomachs, and the diminished room for their distention, which make tight clothes a common cause of inanition, of functional derangements, and of passive congestions, which show themselves in the mottled arms and red noses of half the belles in a ball-room.

The bodies and brains of young women, in the wealthiest and most luxurious circles of society, constantly reveal their imperfect nutrition. Refined emaciation, fair anæmic complexions, eyes made brilliant by dilated pupils, decorous concealment of undeveloped busts and slender arms, excitable and restless temperaments,—wanting sometimes in self-control, but oftener sobered by over-conscientiousness,—are the retributive symptoms which betray a lack of food, sleep, fresh air,

and repose. Some of those who embody these conditions delight to think that Providence has distinguished them from the common herd by certain peculiarities of constitution, and they cherish with great self-satisfaction their supposed idiosyncrasies in regard to what they eat, and in reference to various habits of life. They do not know, or are unwilling to admit, that "want of tone," of which they complain, is only another name for the inertia of exhaustion.

It is useless to humor, or to tease with restrictions, the capricious digestions of those who argue over every mouthful of their food, instead of swallowing it, and whose gastric neuralgias and low level of health are dependent on the defective general condition of their bodies. An eminent modern physician has declared that "he never knew a dyspeptic get well who undertook to regulate his diet;" and the stomach, we are told,—like a schoolboy,—is sure to get into mischief unless constantly occupied. If it behaves perversely, therefore, the doctor must conquer the stomach, and not the stomach the doctor.

We talk and write about "functional diseases," in people such as I have described. It would be more correct to call them "nutritional diseases." Function depends upon nutrition, and nutrition equally depends upon function. No functional condition can exist for a moment, without entailing a change in nutrition; and the extent to which this may be carried, short of organic detriment, is an important practical question in pathology. Any

change which the microscope detects,—such as a most trifling variation of aspect or behavior in the presence of reägents,—is simply enormous considered as a modification of molecular nutrition. That visible alteration,—structural disease, in fact, —may have its ultimate origin in pure disturbance of function, is hardly to be regarded as a mere speculative suggestion.[1]

The most superficial observer will perceive that the principal field for therapeutic advance, in the near future, is most likely to be found in the regulation of food, habits, and the incidents of life. Daily and continuous in their operation, these must be of vastly more importance than drugs and "treatment," which are but transient in their influence. We may speculate about ptomaines, leucomaines, and auto-infection, or, with unshaken faith, adhere to the doctrines of bacteriology; but it is still true that the conditions of disease are increasingly traceable to avoidable violations of hygienic law. The care of health, even more than the care of disease, is recognized as the office of physicians. Their duty in this direction has already become the largest and most vital responsibility of the medical office. It is estimated that the annual loss, in the United States, from one single cause,—the preventable typhoid fever,—is twenty-five millions of dollars, in money value.

The average age of the generation is increasing; the general death rate is decreasing, and there are

[1] Lancet, Nov. 7, 1885, p. 841.

fewer days of sickness, *per capita*, than when observers began to keep record of such matters. The possession of wealth, with its resultant exemption from privation, lengthens the average of life nearly ten years,[1] and good nutrition is said to be at the bottom of longevity. The saying of the cynic that, in addition to a benign stomach, a bad heart is also essential to health, may, perhaps, be open to doubt, despite the fact that insensibility and indifference must neutralize much of the mental anxiety which undermines physical strength, and weakens self-control.[2]

Worry is often a needless, though not always an avoidable evil. The attempt to carry on, simultaneously, diverse occupations, and the quick and rushing methods,—intensified by the disturbing accessories of the post-office, the telegraph, and the telephone,—which shape the entire organization of American life, are attended by such an amount of mental and bodily friction, that Recreation, as a remedy for the trials and cares of all vocations, has identified itself with the resources for preventing disease, not less than the demand for ample nourishment. The business assiduity of the medical profession renders the exaction of this therapeutic precaution an absolute necessity for its active workers, not merely on personal grounds, but on account of the example it sets to others.

Its never-ending labor, which allows no repose, day or night, is the great drawback of our calling.

[1] Science, July 10, 1885, p. 37.
[2] Appendix VIII.

Medical men are apt to feel that they have no right, for the sake of personal ease and enjoyment, to lose sight of their appointed stewardship. As a result, they too often degenerate into mere professional machines, and care for nothing but practice. This confines their thoughts to a groove, and makes them the slaves of an occupation, rather than its masters. Business itself becomes a dull routine. There are men so equably constituted that, metaphorically speaking, they can "shut up shop" at a moment's notice. Many, if not most physicians, live under a different dispensation. When not pursuing their occupations, their occupations are pursuing them; and they are habitually so busy that they cannot even pause long enough to take their daily bread with comfortable deliberation. Irregular life, and the meagre care which medical men take of their own health, make the death rate, especially from suicide, higher among them than in the general male population, or in either of the other principal professions.[1]

The custom of all cultivated and energetic communities, which, during one month out of twelve, calls for some other than the habitual employment, even though it may be physically more fatiguing, goes to prove that diversion and change are forms of rest, recognized as among the imperative demands of health and well-being. They are not weaknesses to be resisted, at any-rate, by professional men. Compulsory relaxation is never

[1] Lancet, Jan. 30, 1886, p. 203.

so beneficial as that which is voluntary. The utility of vacation, in stimulating the capacity and refreshing the inclination for active duty, goes far beyond the mere pleasure it affords, or the social relations it cultivates. Respite from labor is a safeguard against vexations and adversities which sour the temper and shorten the lease of life.

The thought of being able some day to lay down one's burdens is always alluring. At our last Annual Meeting it was said,—not by one of the oldest members,—that after fifteen years of practice a physician had passed the days of his usefulness, —he was too old for laboratory-work. If the graduating age is to go on increasing, this will not, perhaps, be early for retirement. At all events, it is generally conceded that when he is sixty, a medical man has completed the active period of life; that his ideas have become hardened and stereotyped; that he has accomplished his effective mission, and must leave the path open for other and more youthful spirits.

There are those who have a vague presentiment that, if the harness ceases to brace them up, they shall fall down by the wayside and die; but it hardly speaks well for educated men to become so wedded to routine, that no resources and no pleasures can attract them beyond those within the immediate range of professional occupation. They ought surely to find use for their powers of observation elsewhere than at the bedside. "Successful men may have gained much to retire *upon*, but nothing to retire *to*, if literature, social ties, philan-

thropic interests, nature itself, have been lost sight of, during the rush and struggle of their thirty years of active life."[1] Opportunity for the exercise of skill should be so readily and agreeably discovered in some other than their ordinary vocation, as to make them willingly accept the fact that younger men can do their work better; and so the elder should be ready to step aside cheerfully, and in good season.[2]

I have indicated a few of the undercurrent agencies which, within the last thirty-five years, have modified the general condition of professional interests, as they affect medical men and the community, individually and collectively. So imperceptibly and insidiously have innovations become established, that we scarcely realize the change they have occasioned.[3] The retrospect impresses us with the rapid rate at which medical knowledge progresses, and the vigorous life with which its pursuit is followed. The public profit by this general advance, but the actual gain is discernible only to the initiated.

In this Commonwealth, the Massachusetts General Hospital has been a great element of scientific, professional and social influence,—and, perhaps, equally so throughout the whole of New England, for whose extensive water-shed of patients it was, during many years, the only public medical recourse.

[1] Dr. Roose.
[2] Appendix IX.
[3] N. Y. Med. Record, Oct. 17, 1885, p. 427.

Always in readiness, by wise and liberal expenditures, to adopt improvements, or to be the originator of new designs, it has promoted in many ways the art of caring for the sick in hospitals, and has long been willingly accepted as a typical institution in structural, economic, and sanitary points of view. No better proof of this complacent statement need be offered, than its latest architectural excrescence in Boston, or its model Convalescent Home, on a sunny hillside at Waverly, five or six miles distant from the city. Much of the reputation and of the popular interest which this hospital has acquired is distinctly due to the wise judgment of its Trustees, and to the independence of their financial and executive management.

It is a satisfaction to remind you of the fact that the resources of the Massachusetts General Hospital have never been perverted to the direct pecuniary advantage of its Medical and Surgical Staff, whose services have always been gratuitous. There are querulous laments about unremunerative devotion to the community, in medical journals and by individual physicians, who complain of too much time bestowed in charity, and deprecate the skill lavished on the poor "without money and without price." These facts have been urged as a reason why "pay-patients," in private rooms, or wards, should be either compelled or allowed to remunerate their attending physicians and surgeons; but they have never had weight in the minds of those whose solicitude has guarded the interests

of the Hospital in question. On the contrary, from the outset of its history, it has been realized that such a practice might lead to an objectionable appropriation of its beds by the clients of some designing or prominent official, and that it would be inconsistent with the large benevolence of those by whom it was founded and is still sustained. The office of physician or surgeon is more than its own reward. In any great hospital it is an indirect road to general success in practice; in short, the privileges it involves are so considerable that these positions would be promptly bought for money, if they were for sale. They are gladly accepted, on the conditions posted in every private room and ward of the Massachusetts General Hospital, that, by his appointment, the physician or surgeon "waives all claim for compensation in money, and performs his duty as a charity to the sick and disabled patients under his care, and for the advancement of medical and surgical science."

It is also an acknowledged condition, on the part of every patient accepting the services of its physicians and surgeons, "that no payment shall be made for them, and that no claim of any nature, consequent upon such service, can obtain outside the Hospital, from any member of the staff upon any patient, or from any patient upon any member of the staff who has attended him or her in the Hospital." If the patient desires to express his obligation and indebtedness for professional services received, he is invited to contribute to the

charitable funds of the Hospital. This invitation is not unfrequently accepted.

To dispense charity, without injustice on the one hand, and without being imposed upon on the other, is so difficult, that societies have been organized for the sole purpose of discriminating between fraudulent and honest claims. The benevolent and unrestricted dispensation of medical assistance does not escape imposition. Admission to hospital-wards, either with or without payment of board, is, undoubtedly, an often-abused privilege, so far as the hospital itself is concerned. As a matter of fact, however, instances must be few and far between, in which an attending or a non-attending physician is robbed by an out-patient department, or a dispensary, of the small fees he would be glad to earn; or in which the comfortable honorarium of a specialist is diverted from him by wards or private rooms. Jealousy and distrust are likely to be generated whenever the members of its professional staff have any participation in the financial affairs of a hospital; and pecuniary losses, if they happen, in consequence of this divestment, are fairly offset by the gain in self-respect, the protection from dissension, and from individual avarice, and selfishness, which it offers to those who are associated in the common interests of a charitable institution. That unpaid medical relief exempts such large numbers of people from a necessity for forethought and thrift in regard to prospective sickness, and encourages mendicancy, is another, and, indeed, much graver

consideration. Neither the sagacity of individuals, nor the discussions of Social Science assemblages, have yet been able to suggest a method, satisfactory even to themselves, for the prevention of this contingency.

The general public are year by year better instructed; they grow more and more able to appreciate the qualifications of men, and the result of their labors. There is therefore an interest, outside our own fraternity, in the subjects to which I have directed your attention, in this brief hour of discursive talk.

Medicine and hygiene are among the favorite topics of magazines and newspapers. Diagrams of drainage, temperature charts,—even illustrations of bacilli, and of microscopic sections of malignant growths,—are familiar and attractive features of modern journalism. Elementary physiology and hygiene are taught in the public schools. Instruction in "rendering first aid to the wounded" is given to young ladies, as well as to members of the Police and Fire Departments. Diet-kitchens, dispensaries, hospitals, and sanitary-aid societies are managed by laymen. There is scarcely a reading person who has not heard something of the germ theory. A cow-boy in Arizona was recently shot dead in the saddle for the insult implied in calling his partner "a d——d *microbe*."

Much of this popular zeal is the expression of a most laudable desire to diminish the evils of personal and collective environment. The energy

and the activity which are directed toward the improvement of public health, and to the beneficent alleviations of sickness, impose an obligation on the community, for its own protection, to facilitate and promote sound learning, by a liberal support of thoroughly equipped schools, and other auxiliary means of medical instruction. The proof of interest in this direction will be found, not so much in moral encouragement afforded by words of approval, as in practical steps taken to furnish the guardians of human health with the best appliances for study and investigation. It is a duty of rich and generous men to supply students with every opportunity to become competent for the most profitable kind of work, by a leisurely, complete, and therefore costly training. So long as medical schools are dependent on the fees of their students for support, the highest results cannot be obtained. The report of the United States Commissioner of Education, in 1883, strongly advised that every medical school in the country should be required by law to procure forthwith an endowment of not less than $300,000. In this matter the interest of professors, pupils, parents and the public are identical. The motive is not to make schools for a class, or to create free and charitable institutions, but to provide for the permanent maintenance of first-rate education, unrestricted by the embarrassment of expense, and for the diffusion of its influence among the greatest possible number. In an earnest appeal for the endowment of the Harvard Medical School, Dr.

Oliver Wendell Holmes has said: "The only way to insure the independent action of a school which aims at teaching the whole country by example, is to endow its professorships, so that the very best and highest grade of instruction may always be given. A small number of thoroughly accomplished medical graduates will be worth more to the country than twice or thrice the number of half taught, hastily taught practitioners. In the course of a single generation they will elevate the whole professional standard, as they go forth, year after year, missionaries in the cause of health, soldiers, and, if need be, martyrs, in the unending battle with disease and its causes."[1]

[1] Appendix X.

APPENDIX.

I.

The State and the Medical Profession; T. F. Huxley, Nineteenth Century Magazine, Feb. 1884, p. 228—New York Medical Record, Dec. 5, 1885, p. 633—New York Herald, Sept. 11, 1885; Letter of G. F. Eliot, Esq., Counsel for the New York Health Department—Pamphlet, On the best manner of making use of the Services of Experts in the conduct of Judicial Inquiries; Clemens Herschel, C.E. Printed by direction of the Committee of the Bar Association of the City of Boston on the Amendment of the Law, Boston, 1886—Medical Expert Testimony; F. H. Hamilton, Popular Science Monthly, Vol. 26, p. 603.

II.

Science and Culture; T. F. Huxley; Address on Universities, Actual and Ideal; also, by the same, the article already referred to, Nineteenth Century Magazine, Feb., 1884, p. 228—The Proceedings of the British General Medical Council; London Lancet, 1885, May 16, p. 897; May 23, p. 940. Medical Times and Gazette, 1885, May 16, p. 658; May 23, p. 690; May 30, p. 720—Prof. Humphry; London Lancet, Feb. 22, 1879—A Report of the Committee on Government to the Overseers of Harvard University; E. P. Seaver, chairman; 1881, '82, '83—Biological Teaching in Colleges; W. G. Farlow, Popular Science Monthly, March, 1886, p. 577.

III.

Nineteenth Century Magazine; June, 1880, p. 1089, Doctors and Nursing; Octavius Sturges, Seymour J. Sharkey, Margaret Lonsdale—The same, p. 677, The present Crisis at Guy's Hospital; Margaret Lonsdale—The

same, p. 884, The Nursing Crisis at Guy's Hospital; Sir W. Gull, S. O. Harbershon, A. G. Henriques—The Cornhill Magazine, Vol. 22, p. 452, Nursing as a Profession—London Lancet, Aug. 17, 1878, p. 227; Nov. 28, 1885, p. 1016—New York Medical Record, Jan. 16, 1886, p. 72.

IV.

The Plymouth Epidemic is described in the Philadelphia Medical News, 1885, May 16, p. 541; June 25, p. 681—The Practitioner, Vol. 35, No. 3, p. 234—New York Medical Record, June 27, 1885, p. 710—The Scientific American, June 27, 1885, p. 405.

V.

Fortnightly Review, M. Mackenzie; Vol. 43, June, 1885, p. 772; Vol. 44, Aug. 1885, p. 266—The same Review, Vol. 44, July, 1885, p. 67, H. B. Donkin—Medical Times and Gazette, 1885, April 25, p. 561; June 6, p. 752; July 4, p. 15—New York Medical Record, Sept. 5, 1885, p. 261—London Lancet; Gulstonian Lectures, C. Allbutt, March, 1884—British Medical Journal, Jan. 27, 1883, p. 141—Medical Times and Gazette, Oct. 3, 1874, p. 383.

VI.

"Of one hundred possible operations, twenty are imperatively necessary; twenty are absolutely inadmissible; and the remaining sixty may be performed or not, according to circumstances; and surgeons may and do err in each of these classes of cases." Professor Verneuil, quoted in New York Medical Record, Jan. 9, 1886, p. 56—"Some Ethical Points in the Practice of Surgery," London Lancet, Jan. 9, 1886, p. 72.

VII.

Is Pain a Mystery; I. Burney Yeo, Contemporary Review, Vol. 35, p. 646—The New Cure for Incurables; Lionel A. Tollemache, Fortnightly Review, Vol. 19, p. 218.

The "Birmingham Speculative Club" formulates the relation of the office of the physician to euthanasia, as

follows :—"That in all cases of hopeless and painful illness it should be the recognized duty of the medical attendant, whenever so desired by the patient, to administer chloroform, or other anæsthetic, so as to destroy consciousness at once, and put the sufferer to a quick and easy death; all needful precautions being adopted to prevent any possible abuse of such duty, and means being taken to establish beyond the possibility of a doubt that the remedy was applied at the express wish of the patient." New York Medical Record, Sept 19, 1885, p. 322, Editorial, on a newspaper interviewer's report of the leading physicians of New York City.

VIII.

Female Education from a Medical Point of View, T. S. Clouston; Popular Science Monthly, Vol. 24, p. 214—The little Health of Ladies; Frances Power Cobbe, The Contemporary Review, Jan., 1878, p. 276—Dietetic Treatment of Dyspepsia; New York Medical Record, Nov. 22, 1884, p. 567—Feeding the Sick; New York Medical Record, Aug. 1, 1885, p. 115—Out door Papers; T. W. Higginson, p. 201—Health and Sex in Higher Education; John Drury, Ph.D., Popular Science Monthly, March, 1886, p. 606.

IX.

Recreation; Sir James Paget, Nineteenth Century Magazine, Vol. 14, p. 977—Rest, by an Optimist; Cornhill Magazine, Vol. 22, p. 223—Atlantic Monthly, July, 1885, p. 136—Worry; Mortimer Granville, Nineteenth Century Magazine, Vol. 10, p. 423—Wear and Tear of London Life; Robson Roose, M.D., Fortnightly Review, Feb., 1886, p. 200—Rest and Repair of London Life, Robson Roose, M.D., Fortnightly Review, April, 1886, p. 500.

X.

The German government has rebuilt the University at Strasburg, at a cost of £711,000, with a yearly grant of £40,000, the plant being divided as follows :—Chemical Institute, £35,000; Physical Institute, £28,000; Botanical Institute, £28,000; Observatory, £28,000; Anatomy,

£42,000; Clinical Surgery, £26,000; Physiological Chemistry, £16,000; Physiological Institute, £14,500 (London Lancet, Sept. 19, 1885, p. 535).

A National University was recommended in the annual report (1885) of Mr. Lamar, Secretary of the Interior. The above figures, as a suggestive estimate of cost, would probably startle Congress, unless it were well assured that the privilege of appointing professors, as well as of dictating their resignation, should rest with Senators and Representatives.

ARTICLE XXVII.

ABUSE OF MEDICAL CHARITY.

A REMEDY APPLIED IN 3000 CASES OF OUT-DOOR PATIENTS: RESULTS.

By FREDERICK F. DOGGETT, M.D.
OF BOSTON.

READ JUNE 8, 1886.

ABUSE OF MEDICAL CHARITY.—A REMEDY APPLIED IN 3000 CASES OF OUT-DOOR PATIENTS: RESULTS.

At the present time when "a little less than one-fourth"[1] of the inhabitants of Boston is receiving medical treatment free of charge, it is certainly of great moment to the physicians of Boston to learn to what extent their charity is being abused, and if possible to find some remedy to correct such abuse.

It is hardly necessary to say a word as to the mere existence of such abuse, as it would be almost impossible to find a physician, who has had even a limited experience with charity cases, who would deny it. With such a physician it is perhaps his weekly or even daily experience to treat gratuitously certain persons who live in comfortable homes, well furnished, are themselves well clad, not only able to procure all the necessities of life, but even many of the luxuries. Many persons in such circumstances, in considering their expenditures, seem to make no provision for sickness, but as a matter of course look upon medical treatment as a blessing as free to them as air or sunshine, and so appropriate what may be left over from the cost of necessities of life to an evening at the theatre or to some other gratification equally out of place under the circumstances.

To those who have not had experience with charity cases, does it seem probable that all the ninety thousand and more persons in Boston applying for free medical treatment are

[1] C. D. Kellogg, N. Y. Medical Record, Nov. 28, 1885, p. 616.

objects of medical charity? Luckily, we have a standard of numerical comparison whereby we can, reasoning from analogy, raise the question above probability. In New York City the experiment has lately been tried of investigating the circumstances of each doubtful case, *ad seriatim*, as they applied at the New York Dispensary. The number of cases investigated[1] was 845; of this number, 504 were deserving; 235 were not; 38 were doubtful, and 68 could not be found. Thus 59.6 % were deserving.

Dr. A. Siebert[2] of the German Dispensary, reports that out of 434 cases investigated, 107 gave wrong addresses; 187 were fully able to pay; 42 were able to pay small fees; 75 were unable to pay, while 23 gave no answer. In another series,[3] investigated for the managers of this dispensary by the Charity Organization Society, from January to March, inclusive, 1884, out of 192 cases, 64 were able to pay, 65 not able, while 63 gave wrong addresses.

In another New York charitable institution, in a series[4] of 79 investigated, 24 were able to pay and 27 gave wrong addresses. And finally, in another series of 400 cases one-third were unworthy and one-third had given wrong addresses. As a result of these investigations, it was found that something over 50% of the cases were unworthy of medical charity. In the light of these figures, is it not reasonable to suppose that at least a large minority of such cases are to be found in Boston? Further evidence on this point will be adduced from the writer's figures as given later in this paper, which would go to prove that at least 23% of all cases applying in Boston are unworthy of medical charity. Much of the same results have been obtained in similar investigations in Philadelphia.

[1] Dr. T. F. Gaunt, N. Y. Medical Record, Nov. 28, 1885, p. 616.
[2] Loc. cit.
[3] N. Y. Med. Record, June 13, 1885, p. 670. Vide Edit., loc. cit. May 30, 1885, p. 598.
[4] Loc. cit. Nov. 28, 1885, p. 616.

And when we consider that in London and New York, more than one-fourth of the inhabitants are treated free of charge; in Philadelphia, one-fifth; while in Liverpool 298,260 persons out of a population of 579,724,[1] or more than one-half, are so treated,—one can realize the extent to which the abuse has gone.

It is not proposed in this article to consider the causes which have produced this state of affairs, wherein so large a proportion of the inhabitants of large cities have got into the fashion of seeking medical charity. Nor is it necessary to consider in this place the motives which induce medical men to give so much of their services. However widely writers on the subject have differed on these two questions, there seems to be much unanimity in the opinion that promiscuous medical charity is alike demoralizing to the recipient, and detrimental at least to the income of practitioners taken as a body.

Scarcely a month passes in which the London Lancet or British Medical Journal fails to contain some complaint of the absorption of private patients into Provident Associations or free hospitals and dispensaries. In an editorial in the London Lancet[2] on a paper by Mr. C. J. Radley on "The best plan for establishing Provident Dispensaries in due relation to hospitals," there will be found abundance of such complaint; also in another editorial[3] on a proposition to disfranchise persons receiving medical charity. New York and Philadelphia Journals have of late mirrored much the same state of affairs in those cities, especially in the former. Dr. W. L. Carr[4] has written on the impoverishment of the young physician through abuse of medical charity. While "Caritas Vera"[5] complains that in going

[1] British Med. Journ., Sept. 5, 1885, p. 471 *et seq.*
[2] Jan. 31, 1885, p. 214.
[3] Loc. cit., June 9, 1885.
[4] N. Y. Med. Rec., Mar. 7, 1885, p. 278.
[5] Idem, Feb. 7, 1885, p. 168.

a not very long distance to visit a certain patient, he must pass by no less than four free dispensaries. He suggests that if patients were questioned more thoroughly by dispensary physicians there would be less abuse.

The abuse of medical charity having for some time been admitted, and the wide spread evils therefrom noted, attempts have naturally been made to remedy the trouble. The two principal schemes which have been tried are the Provident Societies, principally in Europe, and the Charity Organization Society in America. In the London Provident Society—the earliest type of them all—the person seeking medical aid may be elevated from the position of a charity patient to the dignity of a pay patient, by paying the sum of six-pence per month; of ten-pence for husband and wife, and two-pence for children under 14 years of age. The scheme does not seem to thrive on American soil, for some reason. In England, one would judge from editorials and communications in the British Journals, that on the one hand the scheme diminished the receipts of the physician while adding to his labors; while many apparently respectable persons who would scorn to accept charity as such, have satisfied their scruples and avoided the physician's bill by joining a Provident Dispensary. In this way the abuse of medical charity has not been corrected but has taken a more respectable form, in which guise the abuse is more difficult to meet.

In case of the Charity Organization Society, it is proposed that the various charities of the city, instead of working at cross-purposes,—as for example, by assisting a family previously found unworthy of assistance by a neighboring charity,—shall have a system of intercommunication, and shall assist only those cases which are found worthy after examination of their circumstances. Thus the register of the New York Charity Organization Society contains the names of 98,000 families who have applied for medical

relief, together with their standard of worthiness or the opposite.

Of late many such alliances have been established in European cities as well as in no less than forty cities and towns in this country. It is hardly necessary to say that the investigation bears on general relief as well as medical. In the writer's opinion, this scheme is calculated to do great good. For instance, if all the charitable institutions in Boston should agree to treat no case that did not bring a card from the Associated Charities, say, endorsing the person's worthiness after investigation, how completely would the abuse of medical charity be stopped! But that ideal time has not yet arrived.

If it were possible for each dispensary and hospital to contain a register of the thousands of families in Boston unworthy of medical charity, it would apparently not be difficult, nor would it take too much of the physician's time, to decide which cases to reject. In the absence of such information, at present it is possible to learn through a card of the Associated Charities the charity status of any family, where it is possible to look it up. This might work reasonably well in cases of no urgency, as with most of those coming to the consulting rooms of hospitals and dispensaries. Of course, treatment would usually have to be deferred for twenty-four hours. But in regard to cases sick in bed such as the district physician attends, prompt treatment is demanded by the nature of the case, and time could not be allowed for investigation. In the light of these suggestions, it must be admitted that the scheme would be cumbrous as applied to the district physician's work.

During the early months of his district dispensary practice, —October to December, 1882—it became evident to the writer, judging from the surroundings of many of the patients,—as from the rents paid, the furnishing of their

houses, and the amount of their wages when discoverable,—that many were able to pay their physician's bill.

The position of affairs cannot be better illustrated than by relating two or three of the more glaring cases.

He was called to treat a sick child in a family occupying a well furnished suite of rooms. On inquiring as to the apparent prosperity of the family, the mother declared that they had seen better days, but that her husbahd was then sick in the hospital with an incurable disease, and that the rest of the family was living on money loaned on the furniture. Some time after, it was learned accidentally through another family living in the same block, that in reality the husband was well and attending to his business; he being the junior partner in a liquor firm which owns two establishments, not far from the lower end of Broadway, South Boston.

In another case where the writer's suspicions were aroused, the mother declared that her husband earned but six dollars a week as a barber working on short time, and with several children they were very poor. The husband was afterwards discovered to be the proprietor of a barber's shop on Broadway, and there was business enough to compel him to hire two assistants. He was amply able to pay his physician's bill.

In still another case, after having treated a woman on several occasions, it was accidentally learned that her husband owned the house in which lived another family besides their own; that he further owned two horses and carts and was doing a retail coal business.

It is perhaps hardly worth while mentioning the family who explained that the reason they could pay no physician's bill, for the time being, was, that they had to set apart a certain sum each month, to meet a bill on a comparatively expensive set of furniture they had lately purchased on the instalment plan.

And finally, may be noted the case of the lady—previously a private patient of the writer's—who clad in her third-best dress, probably for the occasion, unwittingly stepped into his presence for treatment at the woman's room at the Dispensary.

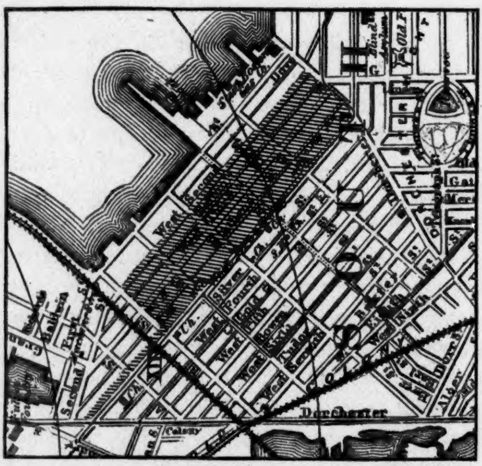
It is only fair to say, that aggravated cases like the above were only encountered while the writer was yet new to the district, and before he began to question as to the circumstances of the patients.

It is proposed to devote the remainder of this paper to the statement, working and results of a simple plan for preventing abuse of medical charity, adopted by the writer early in 1883, and continued since then in district dispensary practice.

The plan was briefly as follows:—in doubtful cases to ask—1st, the number of persons in the family; 2d, the united wages or total source of income; 3d, as to the permanency of it, and as to any debts due from previous lack of work; 4th, as to the rent paid. Afterwards, as a supplement to this, to confirm the answers by statements of neighbors. Next, to note the unworthy families.

If in the writer's judgment, on pressing the above questions, the family was unworthy, free treatment was refused except in urgent cases. A family of seven or eight persons, with an income of $30 to $40 per month, was always treated. Not so a family of three persons with an income of $60 to $70. All the circumstances were considered, such as the permanency of income, previous lack of work, or sickness. In cases of refusal to answer questions like the above, the case was judged unworthy. This state of affairs was not infrequent. It must be admitted that that is a lenient judgment which rests on the statements of the defendant, and that in a plan of this kind there is small chance of injustice in the distribution of medical charity—at least, so far as the receiver is concerned.

The above questions, in the experience of the writer, could be asked and answered in less than a minute, which is not an unreasonable time to take when it is remembered that it was only at first that many such cases were met with; for apparently, when it was learned that they were likely to be subject to an investigation, such cases became scarce. In this way, the writer believes that there was in the end a saving of time and trouble. This is also borne out by referring to the table, No. I., where we can see that in October, November and December, 1882, the number of cases from the pay-district was much in excess of those coming in the corresponding months of the next year.



The part of Boston in question is that part of South Boston, bounded by portions of Dorchester Av., Broadway, and Dorchester St., and the water of Boston Harbor. (See map.) The shaded portion represents the part of this territory occupied by comparatively well-to-do people, such as mechanics, clerks, shopkeepers, etc. For the most part, these

people pay their physicians' bills, and are able to do so, with some manifest exceptions. Rents range from $10 per month and upwards. Many own the houses they live in.

The rest of the territory—the unshaded part—is bounded by portions of Second St., B St., Athens St. (including both sides), Dorchester Av., the water, and a part of Dorchester St. It is occupied by people of small means,—for the most part day laborers, with a few fishermen, junkmen, etc. Rents range from $4 a month to $10 or $12, and as this is the region of large families there is more or less crowding. It is seldom that families will be found in this district able to pay a full physician's bill.

For convenience, the former territory will be spoken of as the "pay-district;" the latter as the "charity-district." The time covered in the calculations of Table I. and Chart I. was from October 1, 1882, to October 1, 1885. The number of cases treated in these three years was 2,926; of this number, 2,224 resided in the charity-district; 702 in the pay-district.

TABLE I.

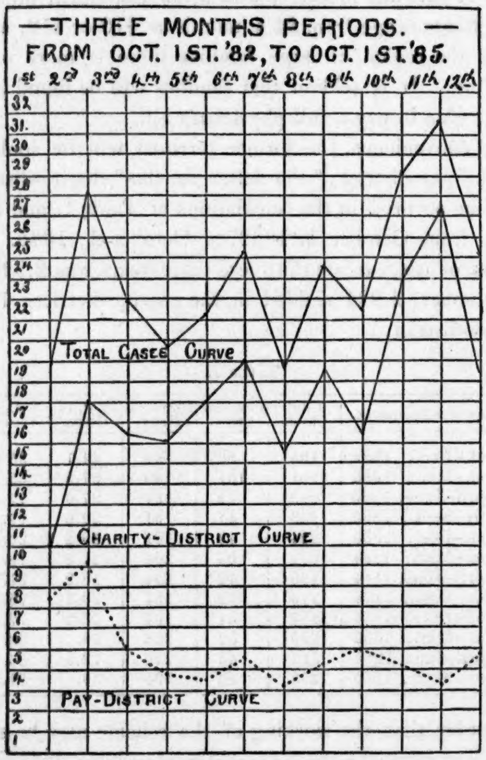
Time of Experiment.	Total Cases.	Pay-Dist. Cases.	Ch'y-Dist Cases.	% P. D. Cases.	% C. D. Cases.
Oct.-Dec., 1882	195	86	109	44.1	55.9
Jan.-Mar., 1883	281	101	180	37.3	62.7
April-June, 1883	229	62	167	27.6	72.4
July-Sept., 1883	208	47	161	22.6	77.4
Oct.-Dec., 1883	224	43	181	19.2	80.8
Jan.-Mar., 1884	258	55	203	21.8	78.2
April-June, 1884	196	42	154	18.9	81.1
July-Sept., 1884	249	52	197	20.1	79.9
Oct.-Dec., 1884	224	61	163	27.2	72.8
Jan.-Mar., 1885	290	52	238	18.	82.
April-June, 1885	319	43	276	13.5	86.5
July-Sept., 1885	253	58	195	23.	77.

In order that the working of the scheme may be shown with its results, the three-years' time has been divided into quarterly intervals. The number of cases treated in each quarter has been reckoned. Further, the cases coming from

the pay-district and charity-district, respectively, as above described, have been estimated, and the per cent. in each to the total number. (See Table I.)

The principal fact that Table I. illustrates—namely, the rapid falling off in the number of cases from the pay-district after March 1, 1883, the beginning of active application of

CHART I.



the scheme—can be shown still plainer in the chart form. (See Chart I.) The three-months' intervals, beginning

October 1, 1882, are represented by the spaces between the vertical lines, while the horizontal spaces represent units of tens of the number of cases coming during the respective intervals. The upper curve shows the tri-monthly variation in the total number of cases; the middle curve, the same variation in the number of cases from the charity-district; the lower dotted curve, the same for the cases from the pay-districts.

Besides the falling off in the pay-district curve after March 1, 1883, it will be noticed that it continues at a low level thereafter, showing how few unworthy cases came after investigation began. On the other hand, the charity-district curve attains and keeps a higher elevation; the high point attained by this curve in the 10th and 11th quarters, is due to the fact that there was prevalent an epidemic of measles in the poorer part of the district during the winter and spring of 1884 and 1885. Otherwise, this curve would have been more uniform in character. The rise of all the curves during the first six months of the author's service may, perhaps, be due in part to the fact that he at that time came a new man into the district, and on that account was more likely to be imposed upon. It is further explained by the fact that it was no doubt influenced by the usual rise coming at the advance of winter, as witness also the rises at the winter periods of the 6th and 10th quarters.

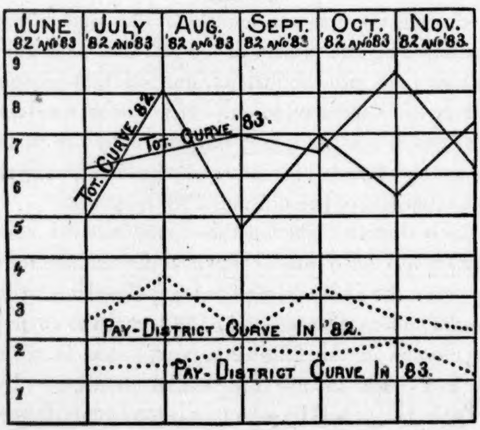
To throw further light on the scheme and its results, a comparison has been made between the number of cases coming from the above mentioned pay-district, during the six months ending December 1, 1882, and the corresponding six months in the following year,—that is, after the scheme had been in use for several months. By the table (Table II.) it will be seen that some twenty fewer cases in every hundred of total cases were in the habit of applying for medical charity (also including those cases refused treatment) during the interval from June to November, 1883,

than in the same interval in 1882. While in the former interval, 164 persons, in some measure able to pay, got

TABLE II.

Months Before Experiment.	Total Cases.	Pay-Dist. Cases.	Ch'y-Dist Cases.	% P. D. Cases.	% C. D. Cases.
June, 1882	51	25	26	49.1	50.9
July, 1882	82	35	47	42.7	57.3
August, 1882	47	23	24	48.1	51.9
September, 1882	70	33	37	47.2	52.8
October, 1882	55	26	29	47.2	52.7
November, 1882	73	22	51	30.2	69.8
Months During Experiment.	Total, 378	Total, 164	Total, 214	Total, 43.4	Total, 56.6
June, 1883	62	14	48	22.6	77.4
July, 1883	66	14	52	21.2	78.8
August, 1883	71	17	54	24.	76.
September, 1883	67	16	51	23.9	76.1
October, 1883	85	20	65	23.6	76.4
November, 1883	62	14	48	22.6	77.4
	Total, 413	Total, 95	Total, 318	Total, 22.9	Total, 77.1

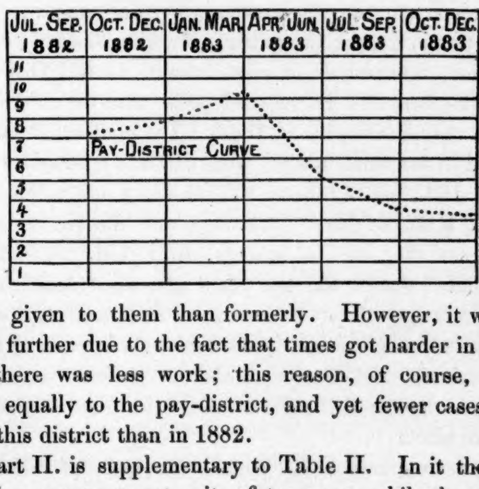
CHART II.



medical charity; in the later interval, under working of the plan, only 95 such persons got such aid. Yet, in the latter interval, instead of there being a smaller number of

total cases treated, there was in reality an increase of 35 cases. Further, it is to be noted that in the first interval there were 214 cases in a great degree deserving of medical help, while in the latter this number had increased to 318. As the writer understands it, the great object of medical charity is best attained when such persons as in general make up the first mentioned class can be to some extent excluded, while the physician's time and attention can be given the better, by such exclusion, to the really deserving class. One of the reasons why 104 more cases were treated in the latter interval, comprising the poorer patients, was, that they probably observed that more of the physician's time and attention was

CHART III.



being given to them than formerly. However, it was no doubt further due to the fact that times got harder in 1883, and there was less work; this reason, of course, would apply equally to the pay-district, and yet fewer cases came from this district than in 1882.

Chart II. is supplementary to Table II. In it the horizontal spaces represent units of ten cases, while the vertical columns represent the periods of time. It well illustrates the low pay-district curve in 1883 as compared with that of 1882—before inquiries were made. It further shows that contemporaneously with this lowering the total number of cases had increased, as can be seen by comparing the total curve for 1883 with that of 1882.

To show in the simplest manner the working of the plan, Chart III. has been constructed; six, three monthly intervals, are formed by the time between July, 1882, and December, 1883—a period of eighteen months. The number of cases treated, residing in the pay-district, in the respective quarters, as marked at the tops of the columns in the chart, were—81, 86, 101, 62, 47, 43. The horizontal spaces in the columns represent blocks of tens in the number of cases treated. Here at a glance one sees the decided effect of the working of the plan when applied in the spring of 1883.

The argument has often been advanced that any attempt to reform abuse of medical charity would lead to scarcity of clinical material for instruction. The writer's figures refute this in a marked manner; for while this scheme was in action, the number of cases coming to the Dispensary increased from 381 in the six-months interval in 1882, to 413 in the like interval in 1883. The number of cases increased in the whole district from 510 in a six-months interval in 1882 and 1883, to 618 in a like interval in 1885. Dr. S. Hall,[1] of New York, says that the Northern Dispensary of that city, at present, treats only two-thirds of the number that it did ten years ago, when indiscriminate charity was given, yet it does more real good in the cause of charity; and that the good done by a dispensary should be measured, not by the number of patients treated, but by their quality as regards their worthiness to receive medical charity.

After completing this paper—the most of which was written some months ago—a thoughtful paper of Dr. Hasket Derby[2] came under the notice of the writer. He seems to have hit upon much the same plan as above detailed, although no results are given as to the working of it, which

[1] N. Y. Med. Record, Nov. 28, 1885, p. 616.
[2] Boston Med. and Surg. Journal, Nov. 12, 1885.

would be much more difficult in such a field, namely, in an in-patient service made up of patients living over a wide territory. The plan is to combine the duties of an amateur detective with those of the physician, in suitable cases. Dr. Derby says—"passing over other plans, the solution of the whole matter seems to me so simple that I mention it with diffidence. It is but to accept the principle that the out-patient department is for the benefit of those whose lack of means would prevent their obtaining relief elsewhere and to leave the application of this principle to the physician in attendance." He further points out that "police work" of this description, though distasteful, is not as onerous as would at first sight appear, as in regard to most of the cases there is little or no doubt. He further continues,—"and when anything in the dress, manner or statement of the individual causes hesitancy to be felt, a few questions, put with tact and kindness, will readily resolve the matter; or if any doubt should still be felt, the applicant for aid should certainly receive its benefit. It is not pretended that the medical examiner will be infallible, but we claim that fewer mistakes will be made by him than by any other to whom this task may be delegated."

In taking leave of the subject, I wish here to record my opinion, that by practice of the above detailed plan, abuse of medical charity in the dispensary district of which the writer has charge has been almost completely stopped. Let the above mentioned experience and figures bear me out. How far the scheme is applicable to similar practice in other sections is for others to judge.

ARTICLE XXVIII.

THE MANAGEMENT

OF CASES OF

RIGIDITY OF THE OS UTERI IN LABOR.

BY WILLIAM E. BOARDMAN, M.D.,

OF BOSTON.

READ JUNE 8, 1886.

THE MANAGEMENT

OF CASES OF

RIGIDITY OF THE OS UTERI IN LABOR.

A CORRECT appreciation of the condition implied by the term, *rigid os uteri*, is a necessary preliminary to its proper management. Many practitioners, indeed some obstetric writers, failing to distinguish between cause and effect, have confounded different conditions of tedious labor where dilatation occurs with abnormal slowness. The os may be soft, yielding, *dilatable*, and yet it may dilate very slowly or its dilatation may stop entirely, for a longer or shorter period, from a variety of causes, but it is a misapplication of the term to say of these cases that rigidity of the os or cervix is present and obstructs labor. For instance, quoting from Bedford,[1] "it will occasionally happen that the os uteri does not respond to the efforts of the uterus, the contractions recur at intervals, but they have not sufficient force; the patient becomes wearied with the abortive efforts of nature; her strength gives way, and the nervous system is much disturbed. Here, then, is a condition of things which must not be misapprehended,—do not mistake it for rigidity of the os." A similar caution might be enjoined with reference to many other complications of the first stage of labor, among which I may mention obliquity of the uterus, faulty positions and presentations of the fœtus, abnormalities of the fœtus and of the pelvis, hydramnios, constriction of the cervix from compression between the fœtal head and pelvic brim, constriction and hypertrophy of the anterior

[1] Principles and Practice of Obstetrics, p. 362, 5th Ed.

lip. In these cases, to be sure, rigidity may also occur as a coincident or secondary complication, but in themselves they are not usually a cause of this condition ; they may and commonly do occasion delay in dilatation, but they do so merely because they complicate the normal process of labor, but, as soon as the specific complication is overcome by the efforts of nature or by appropriate treatment, dilatation may go on without interruption. In other words, the imperfect dilatation as a rule is merely the negative result of these abnormal conditions to which we have referred.

True rigidity, on the contrary, should imply an *undilatable* condition of the os,—and this is to be understood in a relative and not an absolute sense,—where dilatation does not ensue, or occurs with abnormal slowness, or is arrested, on account of certain accidental conditions arising at the time of labor,—of congenital defects of formation or acquired physiological or pathological deviations in the structure of the cervix. In these cases, only, the undilatable os is truly rigid and becomes an efficient cause of delay to labor, and this obstruction may persist, under certain circumstances, so long as to endanger the mother or child or both together.

The scope of my paper obliges me to omit the consideration of those cases where the dystocia is due to radical defects of development, to complete atresia, and to pathological changes incident to malignant and fibroid disease of the cervix, which often require special methods of treatment, perhaps peculiar to each individual case, and to restrict myself to the discussion of the more common ones to which reference has been made, including spasmodic stenosis, the most usual form in primiparæ, and rigidity from simple pathological changes which appertain to cicatricial, hyperplastic or hypertrophic induration, and, as a rule, are met with only in multiparous women.

Actual labor, I need not remind you, is commonly divided into three stages, with the first of which only, the

period of dilatation, have we to do at present. Strictly speaking this comprises the entire period occupied in the expansion and retraction of the cervix and the full dilatation of the os uteri. For clinical convenience, however, it is customary to await until the cervix is "taken up," as it is termed now-a-days, before it is considered that labor is imminent. So that, other factors being normal, our attention at first is largly directed to the os in estimating the probable character and duration of the labor.

In what may be called normal labors, the length of this first stage varies considerably, according to different circumstances which it is unnecessary for me to enumerate at this time, and it is generally conceded that, so long as the os continues to dilate, however slowly, the membranes are intact and no extraordinary accidents or emergencies threaten or occur, we are not called upon to abbreviate it in any manner, except indirectly in the way of husbanding the maternal strength by the various methods which are in common use for promoting rest and refreshment, furnishing adequate nourishment and providing for the due performance of the various ordinary functions of the body.

In such labors this stage may continue for days, and yet, with proper attention to these points, neither the mother nor her child will be exposed to any serious injury; the labor may become "tedious" but not "laborious," which latter term properly implies danger in a greater or less degree.

Not infrequently, while all the other factors of normal labor in the first stage occur, delay ensues which, upon examination, is found to be due alone to the condition of the os itself; it is unyielding and rigid—sometimes thick, hard and muscular to the feel, at others thin, wiry, like cartilage or parchment, or swollen and œdematous. Even in these cases, except perhaps in some few instances of notable cicatricial degeneration, so long as the membranes are un-

broken, and the os is pressed upon by the fluid sac during the continuance of the pains which are intermittent in character, interference is rarely demanded, for the cushion of fluid can do no harm to the cervix and the fœtus cannot be subjected to undue pressure at any part, for everywhere it is protected from insult by the fluid with which it is invested.

Sometimes, however, it will be observed that, during the pains, the head impinges directly upon the lowest segment of the cervix, so that no bag of waters is formed, and, if the os is rigid, the irritation, to which it is subjected by the immediate pressure of the fœtal part, will tend to augment the rigidity, especially in a primipara. If such a condition of things be found, speedy relief may often be afforded by pressing up the presenting part and allowing a quantity of fluid to collect in front of it.

In either of these cases, whenever we meet with an unyielding os under the pressure of the fluid sac, and other factors are normal, it is the rule that the pains tend to become abnormal in character, irregular, short and cramplike or continuously severe; the patient soon exhibits symptoms of nervousness, perhaps anxiety and irritability, and, if not properly treated, her general and uterine strength will be wasted, to her detriment probably in the later stages. Anodynes administered to such patients usually will forestall or control these unfavorable symptoms, and a sleep, more or less prolonged, will be followed by a renewal of strength and courage, and, generally, by a more dilatable condition of the os.

In many cases, however, where the os early shows a disposition to rigidity, an accident occurs which most surely leads to an increase of the dystocia,—namely, the premature rupture of the membranes. In other cases this accident obviously is the prime cause of the rigidity, and, in either instance, we are quite sure to have to do with a

laborious labor which will be the source of much suffering, and even danger, to the mother and of peril to the child, and, too, of annoyance and anxiety to the physician. Fortunately, with judicious care and under ordinary methods of treatment, most of these patients ultimately do well and the mother is safely delivered of a living child.

Probably reasoning from this fact the cardinal rule has been transmitted to successive generations, to abstain from manual or instrumental interference in these cases, and to content ourselves and endeavor to satisfy our patients simply with, what often are merely palliative measures, nauseants, emetics, depletion, general and local anodynes, and to await the favorable issue of this stage or the occurrence of dangerous symptoms in the mother or the death of the fœtus. Until comparatively recent years every kind of interference was deprecated, so long as the fœtal life persisted, and, indeed, craniotomy on the living child has been advised and practised by some in the interest of the mother, and this fact led to the scathing criticism by Lovati, of Pavia, who said, "in England they do not hesitate to kill the child, not only in order to save the mother from the danger of the Cæsarean section, but even to spare her the suffering of the simple application of the forceps." Some obstetricians, writing a century and more ago, advocated, while others of later date have sanctioned or timidly subscribed to, the practice of making longitudinal incisions or scarifications of the cervix in cases of rigidity, where threatening symptoms ensue which do not yield to the common methods of treatment. Indeed in more recent and even modern times, such eminent authorities as Velpeau, Kilian, Martin, Scanzoni, Simpson, Murphy and others have given their assent to this dangerous procedure. Concerning this operation Ramsbotham[1] wisely observed, "I should consider it as one of those exceptional modes of treatment which

[1] Obstet. Medicine and Surgery, 5th Ed., 1867, p. 244.

surgeons are sometimes driven to undertake, in consequence of encountering some extraordinary difficulty, not provided for by the legitimate and established rules governing surgical science." Carl Braun[1] states that the field for this operation is extremely limited, and the necessity cannot occur more frequently than once in fifteen thousand labors. The discussion of this method of practice Lusk,[2] very properly in my opinion, dismisses in a very cursory manner with the following words:—"I have purposely avoided making mention of incisions through the vaginal portion of the cervix, as, in a large experience in difficult labors, I have never so far seen the occasion for their employment," though in his chapter on the forceps he introduces this paragraph[3]:—"In cases where it is necessary to expedite delivery, the resistance of the incompletely dilated os may be overcome by a number of incisions about one-fourth of an inch in depth, made with a blunt-pointed bistoury passed between the cervix and the child's head," adding, "it is very rare, however, that this otherwise trivial operation is really called for."

Contenting myself with this brief reference to the ordinary and extraordinary traditional modes of treatment in these cases, permit me to state, in a few words, the prevailing methods, at least I believe among the most competent practitioners in this country, which, perhaps, are described by no writer more intelligently and tersely than by Lusk, while they are more extensively catalogued by Atkinson.[4]

Premising that the abnormal factor we have to deal with is the rigid os, a stenosis from spasmodic rigidity or due to what I have termed simple pathological changes in the structure of the lower segment of the cervix, in which cases,

[1] Lehrbuch der Geburtshulfe, 1857, p. 768.
[2] The Science and Art of Midwifery, 3d Ed., 1886, p. 454.
[3] Op. cit. p. 369.
[4] Therapeutics of Gynæcology and Obstetrics, 1880, p. 239.

too, the spasmodic action becomes a prominent feature, the first endeavor is to annul the sense of pain and to restore the disorder of the nervous system, so as to induce relaxation of the spasm, and to foster the maternal strength. This end is sought in different ways, largely by the administration of opiates, but more generally by the use of anæsthetics or of chloral, alone or in succession. In some instances, with multiparous women, where the rigidity appears not to be extreme, external frictions of the uterus and oxytocics are admissible, and among the latter quinine, perhaps, is the safest and best. Ergot, on the other hand, is rightly considered a dangerous agent at this stage for many reasons, nor is Kristeller's method of expression applicable, except in rare cases, until a later period. Electricity has been warmly recommended again of late. Judiciously applied it is said to relieve spasmodic action, to promote dilatation and to increase the regularity and efficiency of the pains. Vaginal and rectal injections of simple hot water or medicated solutions are frequently employed, and apparently with benefit in some cases. Hip baths, also, are serviceable, but generally inconvenient. The local application of belladonna in the form of ointment, I think, is now rarely employed. Not unlikely cocaine will prove to be an important adjunct to our measures for the relief of these cases. Amyl nitrite and atropia, also, have lately been recommended, as efficient agents for relaxing a spasmodic condition of the os. Venesection is rarely employed in these days, and the same may be said of nauseants and emetics, though formerly, of course, much reliance was placed upon all of these. When the os is sufficiently dilated to admit the introduction of the forceps, it is the practice of some eminent obstetricians, notably of Dr. Johnston, of Dublin, to employ this instrument at an early period, and Dr. I. E. Taylor has devised a long, narrow bladed pair of forceps for this purpose, which is said to be capable of introduction through a cervix

measuring hardly one and a half inches in diameter. Artificial ditatation of the os has been advised or suggested by many distinguished obstetricians, from the time of Smellie, if not before, while it has been condemned in unmeasured terms by contemporaneous authorities. Thus Churchill[1] said of it, "I do not deny that dilatation may thus be effected; but I believe it to be hazardous in skilful hands, positively dangerous in unpractised ones, and unnecessary in all cases;" and Bedford[2] remarked, "the abominable practice, commended by some of the older writers, of introducing the hand into the vagina for the purpose of distending it [the os uteri], is not for an instant to be tolerated. These rude manipulations can never receive the sanction of the scientific accoucheur." Sir James Simpson,[3] however, Dr. James Braithwaite in 1879[4] and a few others of later date, have revived, sanctioned and advised the resort to digital dilatation when the rigidity has persisted so long as to induce symptoms of danger. To Robert Barnes is due the credit of demonstrating the advantages of a *more early* resort to artificial dilatation, a practice which is now generally commended by accoucheurs of the largest experience, but he gives his preference without stint to the use of "Barnes' bags" for this purpose. Referring to digital dilatation in the form of dystocia under consideration, after describing with some minuteness the technique of the operation, he says,[5] "in some cases in which the second stage of labor has advanced, the cervix may sometimes be dilated by the hand, but," he adds in the same paragraph, "what is called manual dilatation of the cervix should be abandoned, except in the case of spasmodic contraction after expulsion of the child—as, for example, when the placenta is retained or

[1] System of Midwifery, Am. Ed., 1843, p. 235.
[2] The Principles and Practice of Obstetrics, 5th Ed., 1871, p. 361.
[3] Op. cit.
[4] Trans. Obstet. Soc. of London, Vol. XXI. p. 38.
[5] System of Obstetric Medicine and Surgery, Am. Ed., 1885, p. 744.

clots are filling and irritating the uterus." Lusk, too, gives his entire assent to the early employment of these dilating bags.

While we may not accept fully the specious arguments of Sir James Simpson,[1] which were largely founded upon the dangerous deductions from statistics, or be allured by the ponderous logic of Matthews Duncan,[2] experience, if not common sense, seems to teach that the undue prolongation of the first stage, with the abnormal conditions of ruptured membranes and a rigid os, is attended with danger both to the mother and child, and the danger to both is progressive with the increasing duration of this stage. Therefore it is a matter of great importance for us to determine when this stage is becoming unduly protracted, and, for this purpose, we must have regard both for the mother and for her child. Neglect of this common regard has led to the unnecessary sacrifice of human life and to the opprobrium of the obstetric art. It has been too common to delay too long in order to see what nature can endure, rather than to endeavor to determine, as early as possible, how much she can accomplish. Taking this, then, as the theme for my concluding remarks, permit me, by way of introduction, to recite briefly the histories of two cases, which occurred during one of my terms of service as visiting physician at the Boston Lying-in Hospital.

CASE I.—Addie S., single, 25 years of age, primipara, entered January 28th. From the first she was nervous and despondent. She continued to have pretty constant aching pain in the lower abdomen and sacral region, during the expansion and retraction of the cervix, which was not fully "taken up" until the morning of February 7th, when the os was the size of a ten cent piece, thin and unyielding. The head was low down, at the inferior strait, and the pains

[1] Selected Works of Sir J. Y. Simpson, Am. Ed., 1871.
[2] Mortality of Childbed, &c., Am. Ed., 1871.

were moderately severe, with slight intermissions, during that day. At 6.25, P.M., the membranes ruptured. As no progress ensued, chloral was administered at 7, 7.30 and 8, P.M., with no permanent effect upon the os. At 9, P.M., full surgical anæsthesia was induced and continued for several minutes. Chloral was again given at 11, 11.40 and 12.30, P.M., after which the pains became more severe and nearly constant. At 1, A.M., of the following day, the pains were rather more intermittent and moderately severe, but the os showed no change. At 4, A.M., full anæsthesia was induced for ten minutes, when the os acquired the size of a twenty-five cent piece. At 6.30, A.M., it was rather larger than fifty cents, when the maternal pulse increased from 100 to 125 and the fœtal pulse from 140 to 160. Under this condition of things I was summoned. Learning from the house physician that under the immediate influence of the chloral or the ether the os each time became dilatable for a brief period, but soon recovered its rigidity, I administered two more doses of chloral, and taking advantage of the dilatability which I produced, I easily stretched the os with the fingers, slipped it over the head, applied the Vienna forceps and readily extracted the child, which was asphyxiated but fortunately resuscitated. The mother, however, shortly after died, evidently from shock and collapse. There was no uterine rupture and no hemorrhage.

Reviewing the record of this case, it will be observed that the woman presented unfavorable symptoms from the outset; that she was nervous and despondent; that she suffered, more or less, for more than a week, during the retraction of the cervix; that the os was rigid from the commencement of its dilatation; that the membranes ruptured early in the first stage; that the repeated employment of customary means had little effect in promoting dilatation; that twelve hours after the rupture of the membranes the os was only

as large as a half of a dollar, when symptoms indicating danger to both mother and child supervened; that the resort to manual dilatation, *while the os was made soft and yielding*, enabled me to deliver a living child in a few moments. Its asphyxiated condition, however, I think clearly showed that a little longer delay would have imperilled its life. As it was, I cannot but think that the fatal result to the mother must be attributed, in a measure at least, to the delay in interference, which was especially dangerous considering her protracted mental agony and the prolonged physical suffering which she experienced, though at no time was this notably severe.

CASE II.—Ella P., 19 years of age, single, primipara, entered January 22d, at 11.55, A.M., labor having begun at 1, A.M., of the same day, and the membranes had broken at 7, A.M. On entrance the cervix was "taken up" and the os admitted only the finger tip. Pains recurred quite regularly and with no unusual severity, but it was soon determined that there was delay on account of the condition of the os, which, on the following morning, was the size of fifty cents, thick and rigid. Chloral was twice repeated and snoring anæsthesia was induced, but with slight if any permanent effect. At 4, P.M., of this, the second day, thirty-three hours after the rupture of the membranes, the condition of both mother and fœtus before this having been good, the maternal pulse suddenly rose to 110 and the temperature to 102.8, while the fœtal pulse increased from 140 to 180. Shortly after this I was summoned, and, finding the threatening symptoms still present, I had the patient etherized, but did not administer chloral beforehand, partly to save time but more because I had in mind that in the previous case possibly the fatal result to the mother might have been promoted by the combined effect of the two agents. While under the influence of the ether, I did not obtain the general dilatable condition of the os

which I did in the other case, but the left side dilated readily under the pressure of the fingers, and, having obtained sufficient space, I introduced the forceps,—the head had passed the brim,—and by the combined effects of traction with the instrument and, in the intervals, gradual stretching and pushing up the right side, the os finally slipped over the head, and then the child was quite readily extracted at 6.25, A.M., nearly thirty-six hours after the rupture of the membranes and forty-two after the onset of labor, but it was still born. The mother made a good recovery.

In this instance, too, I believe I conformed essentially to the general rules of practice which prevail in these cases. The error, in delaying interference too long, or until threatening symptoms supervened, I believe, was the cause of the death of the child, as it was, if not the principal, at all events a contributing factor in occasioning the death of the mother in the first case.

That "meddlesome midwifery" is bad and to be avoided needs no argument at this day, but I submit that, while this expression and the doctrines evolved from it have served a very useful purpose in preventing the indiscriminate resort to manual or instrumental interference, when often it is uncalled for and even unsafe, yet increased experience, I think, rightly teaches me that, in many instances perhaps, we have been controlled too completely by the dictates of traditional practice that have been accepted by successive generations as matters of doctrine which ought not to be questioned, and, with this view, I have come to believe with others that the rule, to await the occurrence of alarming or dangerous symptoms, either in the mother or the fœtus, in these cases where the dystocia is due primarily or essentially to the rigidity of the os, is an excess of conservatism which tends to disaster, as already observed, either from violence done to the mother, or from injury to the child in consequence of the great and direct pressure to which it is ex-

posed for so long a period after the escape of the amniotic fluid or on account of its being deprived of proper and sufficient nourishment by the interference with the utero-placental circulation. Accepting this proposition it is our duty to abbreviate this stage, in these cases of dystocia, so far as we are able to do it.

Referring to the success which has resulted in other forms of dystocia from the practice of manual dilatation, notably with placenta prævia and eclampsia and in the induction of premature labor, as suggested many years ago, even by Hippocrates and Celsus, in some circumstances,[1] but revived and popularized in this country, I think, at all events in this vicinity, by our esteemed associate, Dr. A. D. Sinclair, and also to the now well recognized effect of chloral and deep anæsthesia for a brief period in bringing about a dilatable condition of the os,—not to mention some other agents which have been employed for a similar purpose,—I believe we not only have it in our power, but that it is our duty, in these cases of tedious labor which promise to become laborious, to afford timely relief by early interference, as soon as we are satisfied that nature unaided directly by art is not likely to accomplish delivery with safety, by following up the temporary dilatable condition, which we can induce by the use of chloral and like agents, with manual dilatation, and the subsequent use of extracting means if they appear then to be required—that is to say, before dangerous symptoms occur.

If the head be above the brim or not far advanced, and the contractions are not too frequent and severe, the early introduction of the hydrostatic dilators of Barnes will, perhaps, accomplish everything that is required; but these are always open to the objection that, even in the most skilful hands, they are insensible and one is liable to effect dilatation with them too forcibly and too rapidly, and so

[1] Vide Braun, op. cit. p. 763.

start a laceration of the cervix which may end in extensive rupture. Fortunately, however, if we may rely upon recorded cases, this accident is not a common occurrence. My experience confirms that of many others, that, in a large number of these cases, the presenting part impinges so forcibly upon the os and is so firmly invested by the tissues below the "contraction ring," that the bag cannot be inserted within the os without the exercise of so much manipulation and force as to do violence to the tissues, and, furthermore, in many cases it is found impossible to keep the bag in position,—it will inevitably slip out before dilatation can be effected by it.

With manual dilatation, the principle is the same as with the hydrostatic bags, but employing the former we have the advantage of the tactile sense, which enables us to guide and control the process with the utmost precision and hence with due regard to the integrity of the maternal parts.

When the head has passed the brim and entered the excavation, the waters having escaped, I believe there can be no question as to the choice between these two methods of artificial dilatation, and we should resort without hesitation to the use of the fingers to accomplish the desired object.

I have already alluded to the practice of incising or scarifying the os for the purpose of expediting delivery in these cases under consideration, where no disproportion exists and the dystocia is dependent solely upon the rigid, unyielding condition of the os, whether this is a spasmodic stenosis alone, or associated with the cartilaginous condition which is the product of a cicatricial process, a hyperplasia or hypertrophic induration. All authorities agree that this necessity occurs with extreme rarity. My experience, to be sure, has not been very extensive, but I have never met with, nor have I known of, a case where this procedure became necessary. Indeed, I do not believe it is ever de-

manded, except in cases of absolute atresia or occlusion of the os, for, employing anæsthesia, chloral, and like agents, and artificial dilatation *together*, I feel sure we have it in our power to accomplish delivery, even in the extreme cases of simple pathological degeneration of the cervix, without exposing the uterus to the imminent danger of extensive rupture.

With regard to the proper time when the interference of art is demanded, the essential point is to anticipate the period when dangerous symptoms will occur. As before remarked, while the membranes are intact, rarely will we be called upon to interfere, for, in these cases, there is practically no danger,—nature is equal to the emergency and the patient's endurance is not by any means put to the utmost test.

When, however, the membranes have broken prematurely and the amniotic fluid has escaped, and, I may add, this is the rule in the pathological states of the os to which I have just alluded, and we are satisfied that we have to do with a rigid os, recourse should be had, first of all, to the faithful trial of the ordinary means for promoting a continued dilatable condition. These having been fairly tried, but without success, we should at once resort to artificial dilatation, having first administered an opiate, or better chloral, either alone or in conjunction with anæsthesia, in order to develop a temporary yielding condition. This latter procedure, I repeat, I offer as an important and essential factor to the easy and safe performance of the mechanical process which we seek to effect by the dilating efforts we decide to employ.

Following these methods of practice which, I have endeavored to show, are based upon sound common sense, regard for the well being of our patients and respect for the obstetric art, I believe we shall be more successful in avoiding unnecessary suffering and in saving human life.

ARTICLE XXIX.

A NOT WELL-RECOGNIZED SOURCE OF DOMESTIC POISONING:

WITH CASES.

By CHARLES HARRINGTON, M.D.
OF BOSTON.

READ JUNE 8, 1886.

A NOT WELL-RECOGNIZED SOURCE OF DOMESTIC POISONING:

WITH CASES.

THE attention of the medical profession has frequently been called to the poisonous effects produced by stockings, gloves, and other articles of wearing apparel, in the dyeing of which, compounds of arsenic, antimony and tin have been employed. But so far as I am aware—and I have made numerous inquiries, besides consulting considerable medical literature—little, if anything, has been said or written as to the possibility of poisonous effects from such articles dyed with the aid of compounds of chromium.

The use of chromium mordants has been, until quite recently, comparatively limited, owing to an ignorance of satisfactory methods of application. At the present time, however, they are very generally used, and one of them—the bichromate of potassium—is regarded as by far the most useful mordant for woollen goods. All of them yield excellent results both as to color and fastness, but the bichromate is the most valuable, and capable of the widest application. The employment of any other compound containing an equivalent amount of chromium is said to yield to the woollen fibre the mordanting body (the chromic oxide) not so completely, and to produce colors which are not equal in intensity. The only chromium salt which approaches the bichromate in effectiveness for woollen dyeing is chrome alum, but its use requires the addition of large amounts of bitartrate of potassium, and in any case it is not equal to the same amount of

the bichromate. Besides yielding the most excellent results, the bichromate possesses the additional qualification of being most easily applied.

The range of colors produced by the aid of the chrome mordants with the various dyestuffs is very wide, and includes many shades of brown, brownish red, claret reds, olives, yellows, old golds, purples, blues, black, buffs, and grays.

It is a well known fact, that the workmen employed in the manufacturing and handling of bichromate of potassium are almost without exception subject to the so-called "chrome disease," in which severe ulceration of the skin and mucous membranes, and perforation of the nasal septum are the most marked and common symptoms, produced by the irritating and corrosive action of the dust to which they are exposed; and it seems not unreasonable to suppose that under favorable circumstances, equally severe symptoms might be brought about by the wearing of apparel in whose fibre compounds of chromium have been precipitated. And further, it may be assumed that the accidental introduction of dust from the same cloth into the stomach might very well be followed by the characteristic symptoms produced by the ingestion of chromates.

I have been informed by a scientific man engaged in the dyeing industry that such hypotheses are unreasonable because the chromium is precipitated in the fibre in an insoluble form, but the same objection may be applied with equal force to the cases of poisoning which have frequently been reported as due to the use of arsenic, antimony and tin mordants, and to the ingestion of chromate of lead.

Although I have as yet been unable to find any reported cases traced to this cause, I can have no doubt that such cases are common though their cause may not be recognized, for within a comparatively short time several have come under my own observation in which the cause seems to be beyond dispute.

These cases I will briefly describe.

CASE I.—The patient, a stout healthy-looking woman of perhaps 45 years of age, by occupation a cap-maker, purchased between fifty and seventy-five yards of dark blue cloth for the manufacture of military caps, such as are worn by the boys of the public schools. The cloth was of much more lustrous appearance and considerably cheaper than that which she had ordinarily used. After thoroughly sponging the whole lot she began cutting out the caps, which occupation required several days. Within a very short time she began to suffer from an intolerable itching of the hands, face, neck and scalp. At the same time she began to be troubled with intense thirst which no amount of drinking could allay. There was much soreness of the eyes, nose and mouth, burning in the throat and feeling of discomfort in the stomach. Owing to the heat in the workroom, she dressed as loosely and lightly as possible, so that her body became more exposed to the dust from the cloth than it otherwise would have been. The itching became general, and so intense that she was obliged to remove her entire clothing several times every day and bathe her body with cream-of-tartar water, which gave only slight and temporary relief. The itching of the scalp caused such constant scratching that she was ashamed to ride in the horsecars or be seen on the street except after dark, since she was obliged to carry her bonnet in one hand while she scratched with the other. In a very short time after the beginning of the symptoms, there was considerable ulceration on the neck, breast, thighs and hands. The ears were much swollen, and became, as she expressed it, "running sores." On the hands the soreness was most marked about the nails. On the completion of the cutting-out process, she began sewing the pieces together to make the caps, and the soreness of the fingers was much increased by the frequent pricking of the needle. There was now very intense

pain in the fingers, which one by one were disabled and very much swollen. The ulcerations about the nails were much aggravated, and there was sloughing. In a short time she lost three nails from one hand and two from the other. The intense pain, itching and thirst, prevented sleep, and at last she was obliged to give up work. Up to this time she had had no idea as to the cause of the trouble, nor had she received medical attention. At last, however, being thoroughly alarmed, she consulted a physician, who concluded that she was suffering from the effects of poison and advised her to have the cloth examined for arsenic. The cloth was submitted to me for examination and proved to contain no arsenic, but it did contain a large amount of *chromium*.

Work on the cloth was at once discontinued, and in a short time the main prominent symptoms diminished in intensity and disappeared. Her general health is not yet fully restored, although nearly two years have elapsed since the use of the cloth. The symptoms in this case were undoubtedly due to dust from the cloth, which not only was deposited on the skin, but inhaled through the nose and mouth. At the time when the itching of the scalp was at its height, the woman's two children, who lived at home and had nothing to do with the work, began to be troubled with itching and burning in the same place. On inquiry it was learned that the mother and children used the same hair brush, and thus the dust had been transferred from her head to theirs.

Some weeks ago, she had occasion to again handle the unmade caps. Each piece was dusted and packed away, the operation requiring considerable time. On the following day, her hands were very sore, the nails being particularly affected, and since that time one of the latter has come away.

CASE II.—A clergyman of about 60 years of age, of

active disposition and of good general health, purchased a pair of brown mixed woollen gloves, which he wore for three or four days, during which time he took several long walks. His hands have a tendency to perspire freely, though whether they did or not on these occasions he is unable to recall. He noticed a slight redness and irritation of both hands and wrists, but not suspecting the cause he continued wearing the gloves. Three or four days later the irritation increased. It extended from the middle joints of the fingers to a line on the arms corresponding to the somewhat long wrists of the gloves, and it was this limitation which called his attention to the gloves as a possible cause of the trouble, and they were laid aside. To use his own description, "at first it was in the form of pimples, but afterward many of them ran together and became blotches."

The pain and irritation continued a month or more, during which time considerable ulceration occurred. At the end of another month, the ulcers, which were quite large and deep, had nearly healed. About this time he submitted the gloves to me for examination. They proved to contain no arsenic or antimony, but a large amount of *chromium*.

CASES III. and IV.—Two boys, aged respectively 5½ and 4 years, children of a physician, complained, on the evening of March 28th of this year, of not feeling well, and referred the feeling to the stomach. After the administration of a small dose of aromatic syrup of rhubarb to each, they were put to bed.

At five on the following morning the elder awoke complaining of pain in the ear, of nausea, and pain in the stomach. He soon began to vomit a yellowish watery fluid, which, unfortunately, was thrown away. There was considerable prostration, quick pulse, profuse cold perspiration. He vomited in all about a half dozen times. The gastric pain was very severe all day, and was accompanied by headache. In the afternoon he seemed very heavy and

stupid; the headache was now at its worst. The temperature and pulse were high; the cheeks flushed. He complained of pain in the lips, gums, tongue and throat. The lips were swollen; there was intense thirst, which water could not allay.

Meanwhile the younger boy, who had been dressed as usual, began to complain of nausea, and was undressed and put to bed. He soon had all the symptoms of the other, but in no such marked degree. The mouth and gums were very sore.

Up to the time of the first symptoms both boys had been in good health, had not eaten anything out of the ordinary, and had not been exposed to any unusual conditions. In searching for a cause of the trouble there was but one point called to mind wherein their habits and surroundings differed from those of a week and more before, and that was in their clothing. For four days previous to the first symptoms they had been wearing new suits of brown woollen cloth. Their mother, having had a previous experience with arsenic and antimony in stockings, suggested the possibility of poisoning from these subtances, and the cloth was submitted to me for analysis. Before testing for the substances already mentioned I looked for compounds of chromium, which when taken internally produce symptoms similar to those described. The result of the examination showed that *chromium* was present in great abundance.

But in spite of this fact and of the similarity in the symptoms, the diagnosis of chromium poisoning could be ranked only as a possibility. The symptoms in both children were general, whereas one would naturally expect some local action on the skin if due to dust from the cloth. Examination of both boys showed total absence of even slight reddening. It seemed hardly possible that the dust, which, by the way, was given off freely on shaking the cloth, could have produced such severe general and local symptoms.

Careful inquiry as to the means by which the dust could have been introduced into their systems developed the fact that one child constantly sucked his fingers, and that the other was in the habit of biting his nails. The diagnosis seemed then more probable, but perhaps not susceptible of verification.

On consultation it was deemed advisable to administer a cathartic in order to remove any possible poison from the intestinal tract, and about 11, P.M., each child was given a dose of castor oil. White of egg beaten up in milk had been given to each some time before the administration of the oil.

The urine was very scanty and contained a slight trace of albumen.

During the early part of the night the elder boy got some sleep, but was constantly tossing and moaning. At four in the morning he had a severe attack of convulsions, with delirium. The younger had twitching of the muscles, but not so severely as the other, and there was no delirium.

The temperature of the elder was 102.6; pulse 130, weak. The face was very red, and there was profuse perspiration. The temperature of the younger was 101; pulse 120.

After some time the elder fell into a stupor, from which he could only with great difficulty be aroused. The mouth was swollen, painful and dry. Earache in both was very severe. Both had dejections following the administration of the oil, and these were saved for examination.

The stupor, high temperature, pain in the mouth and intense thirst of the elder persisted all the next day. His temperature at night was 103.4; pulse 140. He passed a rather better night, but continued to be dull and stupid in the morning. He complained still of pain in the mouth and tongue; temperature 101.4. On the following day there was perceptible improvement, though still dull and heavy.

There was a return of pain in the ear, and the membrane was punctured. There was occasional pain in the head and abdomen. The urine increased to a normal amount and was free from albumen. Meanwhile the symptoms of the younger had disappeared, and he was up and dressed as usual.

From this point onward the elder improved slowly with occasional relapses. Nine days after the appearance of the first symptoms, he had several bright bloody stools, which were preceded and followed for several days by stools containing much slime. Four weeks later he had improved very slowly, and was thin, pale and generally out of condition. The dejection first following the administration of the castor oil was subjected to chemical analysis, which resulted in the detection of traces of chromium, thus establishing the diagnosis of poisoning. The bloody stools which occurred on the ninth day would seem to indicate sloughing due to the local action of the poison.

The history of these two last cases present a very remarkable similarity in symptoms to those of two children who were fatally poisoned by very small amounts of lead chromate, reported in Eulenberg's Vierteljahrsschrift für gerichtliche Medicin, and quoted in all the recent works on toxicology.

Whether in these few cases the compounds formed by the mordant and the dye-stuffs are in themselves the active poison, or are decomposed by the secretions of the body with liberation of simpler chrome compounds, cannot yet be definitely answered.

ARTICLE XXX.

AN EPIDEMIC OF MALARIA IN EASTERN MASSACHUSETTS.

By ZABDIEL B. ADAMS, M.D.
OF FRAMINGHAM.

READ JUNE 9, 1886.

AN EPIDEMIC OF MALARIA IN EASTERN MASSACHUSETTS.

Between the years 1876 and 1879, for the purpose of increasing the water-supply of the city of Boston, three large dams were made upon the Sudbury river and one of its tributaries in the town of Framingham. The riparian owners afterwards brought suits against the city on the ground of injury to health. The writer, being summoned as an expert, gave testimony in court, that in his opinion before many years intermittent fever would probably appear in consequence of building these dams. A further study of the subject compels the somewhat humiliating confession that no unimpeachable evidence can be found upon which to base this testimony. It is true that in the summer of 1885 a decided epidemic of malarial fever occurred in South Framingham, and that since that time many cases have appeared in various parts of the town, but there is no clear evidence proving a relation of cause and effect between the creation of these reservoirs and the epidemic of fever.

Almost fifty years ago, Dr. Oliver Wendell Holmes wrote his Boylston Prize Dissertation on intermittent fever in New England. This comprised an abstract of all that could be found in the earlier writers regarding the subject, and also a host of observations and opinions gathered from competent physicians living in places where the malady had occurred, together with reports, bearing on the question, from many localities where the disease was unknown, or known only through vague and unsupported tradition.

Two deductions may be drawn from this paper. First, that, since the settlement of the country, intermittent fever, whether as an endemic or an epidemic disease, was almost unknown in Eastern Massachusetts; and second, that the testimony of the greater number of observers was to the effect that the disease is generated spontaneously in swampy situations, and is bred autochthonously in heat, moisture and vegetable decay.

The author in his introduction is at some pains to demonstrate with his inimitable felicity of style and force of diction, that here, in our own New England, are presented all those conditions of latitude, of climate, of rainfall, of summer-temperature, and of soil, supposed to contribute to, if not to cause, the existence of malaria in the pestilential districts of Europe, but leaves "aside all discussion of the more subtle questions which naturally arise."

Dr. Holmes gives a map on which he notes a few places east of the Connecticut river where intermittent fever was believed to have arisen. In most instances the evidence appears hardly sufficient to prove indigenous origin. In the town of Hopkinton, Mass., it seems that in the last century some cases occurred in the vicinity of two ponds; and reference is now made to this fact as a matter of curious interest in connection with the epidemic in Framingham. It is well known that the neighborhood of Providence, R. I., has been repeatedly visited by malaria. Now the Blackstone river, which makes its way to the sea by Pawtucket and Providence, has a source in one of these infected ponds, while the river Sudbury, which flows through Framingham, arises from the other pond, the smaller feeders of the two streams flowing in adjoining meadows.

Another very valuable contribution to this subject is the able and thorough paper published in the Mass. State Board of Health Report for 1880, written by Dr. J. F. Alleyne Adams, of Pittsfield.

In 1877, '79 and '80, it appears that there were twenty cases of intermittent fever in eastern Massachusetts, eleven of which were in Worcester County, five of them, the largest number in any one town, being in Hardwick, the extreme western boundary of that county. In Middlesex there were four, one in Ayer, one in Woburn, one in Billerica, and one in Wakefield. Three cases are reported from Taunton in Bristol County in 1879. None other are known to have occurred since 1836.

But this paper of Dr. Adams is especially interesting as showing how views had changed with regard to the etiology of the disease. Several observers remark the fact that it occurred independently of heat and marsh miasm. In most instances some reference is made to the acknowledged agency of dams and swamps in its production, while clearly intimating that some other more important factor remains to be discovered.

Within the period covered by these papers there have been three distinct epidemics of intermittent fever in New England—the first at the close of the last century, the second in 1836–7, and the third in 1879–80. The intervals have varied somewhat, but may be roughly said to be about forty years. In the second outbreak it appeared in places not attacked before, and in the third again it advanced to new localities. There were besides a few places where it was seen in the intervals of these epidemics.

During one space of forty years we have no record of intermittent fever anywhere in the State of Massachusetts, and for fifteen years, if we except south-west Connecticut, it was not seen in New England.

Dr. William H. Thayer, in a paper on "Malarial fever on Long Island" (N. Y. Med. Jour., March 7, 1885), says: "Its northern boundary in North America, as an endemic, is apparently regulated by two causes, more or less combined: the character of the soil and the mean tempera-

ture." "Eastward of the Alleghany Mountains its northern boundary as an endemic coincides with the isothermal line of 70° F. of mean summer temperature, which, beginning about Sag Harbor, L. I., runs west-northwest to the Hudson river about West Point, thence north as far as Watervliet Arsenal, thence southwesterly through Carlisle, Pa." "This places the greater part of Long Island, Westchester Co. and the valley of the Hudson as far north as Watervliet, within the boundaries of the endemic; which will be shown to agree with the record."

Outside of these limits, described by Dr. Thayer, is a sort of debatable land, where malaria occasionally appears as an epidemic. Within this latter area, along the Connecticut river, in the valleys of Berkshire and Franklin, and about Long Island Sound and its bays, perhaps as far as Providence, R. I., there are localities where the favorable conditions of soil-moisture and summer-temperature combine to make it almost endemic.

Some fifteen years ago intermittent fever seems to have set out on a hostile march through New England. Beginning in south-western Connecticut, it has moved forward slowly year by year, generally in a north-easterly direction. Its course has been somewhat erratic, usually following up the streams, often doubling upon its track, making wide skips of twenty or twenty-five miles, and then geing back again. The column has usually been preceded by a small skirmish line, the main advance not being made until the next year or the year after.[1] In some instances it has first appeared upon high ground and remote from marshy or wet lands.[2]

[1] This is said to be the case in some of the towns invaded in the State of Connecticut, and in Massachusetts also. Dr. R. W. Griswold, Report of the State Board of Health of Connecticut, 1885. South Framingham seems to furnish an exception to this rule.

[2] This was the case at Rocky Hill, Meriden, and East Lyme, Conn., and in some of the towns in this State.

Framingham occupies nearly the geographical centre of Eastern Massachusetts, and is about 30 miles from Providence, 70 from the Connecticut river, and 100 from New Haven, these being, it is believed, the nearest points where malaria may be said to exist in a quasi-endemic form. The town of Thompson in N. E. Connecticut is perhaps topographically the nearest of any where it has appeared, that in 1881; the nearest as regards time as well as distance being Providence, R. I., where it prevailed in 1883–4.

South Framingham is on the Boston and Albany Railroad, and is the point of junction of several important railway lines. The village covers about 600 acres on both sides of the railroad, and contains 4200 inhabitants, 750 families occupying 500 houses. It is a manufacturing place, and growing rapidly. It lies between the Sudbury river basin and that of Lake Cochituate.

The soil of South Framingham is a sandy loam of little elevation, resting upon an extensive bed of quicksand, which underlies all the adjacent country, and is of varying depth and indefinite extent. This quicksand everywhere contains water, so far as known.

On the south and east of the village lies a wide swampy region of some 3000 acres in extent, called Guinea Meadows, constituting the water-shed of Beaver-dam brook, a stagnant, obstructed stream which empties into Lake Cochituate. These swamps, which are partly wooded, are composed of a retentive peat, spongy, and in some places of great depth. Into this bog the sewage of the village filters, or is led by means of ditches and drains. In spite of these unwholesome surroundings the place is not unhealthy.

The part of South Framingham where the chief force of the epidemic of intermittent fever was felt in the summer of 1885, lies south of the Boston and Albany Railroad.[1] It differs

[1] Cases occurred in various parts of the town remote from this region.

somewhat from the rest of the village in three respects. *First*, it is contiguous to, and partly built upon, the Guinea Meadows. *Second*, it is traversed and bounded on one side by a deep stagnant ditch which comes especially under suspicion. This was made by the city of Boston in 1872, in order to connect the Sudbury river with Lake Cochituate by way of Farm Pond and Beaver-dam brook. It has, however, for many years been abandoned and shut off completely from the pond. It has become stagnant, or nearly so, and its wooden sides have rotted and fallen in. A good deal of drainage runs into it. *Third*, when the wind is northwest, which was frequently the case during the epidemic, it comes directly from an area of about 40 acres in Farm Pond, which has been isolated, become stagnant, and is covered with a rank, coarse vegetation.

The district infected contains roughly one-third of the area and one-fifth of the population of the main village. It covers about two hundred acres, half of which, perhaps, is swamp and not habitable. Five-sevenths of the houses in this region were attacked, and in some cases every person in the house.

Among the supposed contributory causes which have existed for a long time in this locality and in various parts of Framingham without the appearance of intermittents may be mentioned: a high summer temperature, hot days and cool damp nights, with the peculiar effluvium of swamps and decaying vegetation; dry seasons and low wells; spring freshets choking up the drains of meadows with silt and leaving stagnant pools "festering and evaporating in a summer's sun;" the digging up of the soil, making new streets, etc.; and the rank growth of vegetation in swamps and hollows. All these things have existed in perfection for an indefinite time in various parts of Framingham during the hot weather.

The connection of malaria with *dams* and artificial res-

ervoirs, especially upon sluggish streams having banks of little elevation, and where wooded swamps are flowed, causing foul exhalations and effluvium when the water is low, is too much insisted upon by observers to be hastily denied. In the thirty towns of Massachusetts visited by epidemics of this disease in the past and present century, there are very few where this condition does not exist. Further, it is an admitted fact in other countries and in this, and especially in New England and in our own State, that the removal of dams and draining off of reservoirs has coincided with, and is believed to have been a cause of, the disappearance of the pest.

As already said, in 1876–7 the city of Boston, having decided to take the Sudbury river for an additional water-supply, began the erection of three large dams within the town of Framingham.

The Sudbury rises in Hopkinton and Westborough. It is a slow stream, having little fall, and wide margins of meadow and swamp, often wooded. It winds through the town of Framingham from the southwestern corner to the northeastern. Stony brook, a large tributary upon which was placed a high dam, is a quick stream, but is, or was, bordered with wide areas of peat bogs and woods.

The water-shed of these streams is largely composed of land which has been, for more than a century perhaps, used for farms and plentifully treated with barn-yard manure. The water of both streams has always had a yellow tinge and pondy taste.

In making these dams the streams were turned aside, their beds exposed and deep excavations made, in some places of 30 feet. Great quantities of alluvium and peat were removed in this work, as was also the case in laying the main conduit to Chestnut Hill, which, as it quits Farm Pond, passes directly through the now infected area of South Framingham and crosses the Guinea Meadows. The work-

men, numbering many hundreds, lived in barracks or shanties built upon the low ground near the bed of the streams, or in the woods and swamps; and most of the work was done in summer, the water being then at the lowest. They lived in the constant association of meadow-mud and fog, drank the water of the streams and worked in summer heat, and yet not a single case of intermittent fever appeared among them, nor in the town anywhere. In 1877–78 the bottom of reservoir No. 1 was dug up from end to end for the purpose of laying a 48-inch connecting pipe.

During 1878–79, the dams being completed, the basins were filled and connection was made with Farm Pond, a natural body of water of no great depth which was utilized as a settling basin. In this manner about 850 acres were occupied by these reservoirs, representing a surface about one-eighth as large as the whole acreage of that portion of the town which from its elevation might presumably receive malarial infection from this source.

At various times since the filling of the reservoirs the water has been drawn off and the bottom exposed, and remained in that condition for months. Hundreds of acres of "drowned lands," covered with black mud and rotting stumps of trees and sending forth a horrible stench, have thus been laid open to the sun. The mud has been removed and placed upon the banks, or used to fill up the dead ends and shallows.

Farm Pond was drawn down in 1881 seven feet, and a temporary channel made around its shores, and in this work great quantities of the muddy bottom were moved.

The smell of sulphuretted hydrogen was, in summer, always perceptible in the sluice-ways and gate-houses at the dams.

In the summer of 1879 the water in the largest basin (No. 3, on Stony Brook) became offensive. This was found to be due to the growth and decay of certain minute

algæ, described as follows by Mr. A. Fteley, the resident engineer, in his superb report on "Additional Water-Supply, City of Boston, 1882."

"These minute plants, which appear to be uniformly distributed throughout the water, flow with it, and are of such small bulk that they cannot be separated by screens; the wind has a noticeable effect upon them, and often blows them towards the lee shore, where they accumulate and form a solid scum of a sharp green color. When in the fresh state they emit a very peculiar musty odor; if stranded by the action of the wind they soon decay and form a bluish-green mass, and develop a smell as of organic matter in the process of decomposition. When in the water the algæ remain suspended for some time, and after a while sink to the bottom. Of the formation of the algæ, or of their origin, little is known; but it is remarkable that they appear very suddenly in large quantities, ... equally distributed through hundreds of millions of gallons of water, 20 feet deep, several hundred feet from any shore, and in very calm weather, ... increasing or diminishing with wonderful rapidity."

It remains only to add to this admirable description, that the sudden disappearance of these organisms was as unaccountable as their appearance, and that the peculiar fœtid effluvium which was caused by them was distinguishable at a long distance from the reservoirs.

In the fall of 1881, the fishy or "cucumber" taste, which has occasionally developed in the Cochituate water-supply, was found in the water of Farm Pond. Professor Ira Remsen, of Baltimore (see his report on the impurity of the water-supply, City Document, No. 143, 1881), attributed the objectionable taste to the presence of "a species of fresh-water sponge, which was found in small quantities on the gravelly or stony parts of the bottom of the pond." "After a short time the bad taste in the water disappeared."

At this time there was an offensive and peculiar odor in the neighborhood of the pond.

The object of these details is to show that at various times during a period of eight or nine years previous to 1885, all those conditions which, in connection with the building of

dams and formation of artificial reservoirs, are cited as being *contributory* causes at least of malaria, had been in operation in Framingham without producing intermittent fever.

It is only necessary to say further that the point where the epidemic of 1885 raged with greatest intensity is more than a mile from the nearest basin, and a mile and a half from any of the dams. No cases in fact occurred about the dams, and very few in the neighborhood of the reservoirs. It is true Farm Pond lies contiguous to the locality; but this is a natural body of water, although receiving that of the basins above.

The history of the epidemic requires but few words. It is hardly necessary to say that intermittent fever, at least in its epidemic form, can scarcely be mistaken for any other disease. A few scattered cases were seen in June and July. The latter month was hot and unusually dry. At the close of July there was a change of weather and a heavy fall of rain. This was immediately followed by the appearance of many cases. August was cold, colder than for fifteen years, and the amount of rainfall was very great (more than 7 inches), much greater than had occurred for a long series of years, August being generally hot and rather dry. Between the end of July and the latter part of September, when the disease began to decline, more than 200 cases were seen and reported by the various physicians of the town. Others are believed to have occurred which were not seen and not reported.

As usual the type of the disease was tertian, rarely quotidian, more rarely still quartan. In many cases there was but one severe chill. People of all ages were attacked. There was generally a day or two of malaise or headache before the seizure. Vomiting was a frequent occurrence. The chill lasted one, two or more hours; the fever was intense, and was followed by profuse sweating, which con-

tinued in many cases far into the night. On the following day the patient was found completely recovered, or complaining only of weakness. There was one death, a feeble woman and very old, who refused all treatment. An Italian, one of the workmen upon the new conduit in Farm Pond, was sent to some State Institution, where he is reported to have died from the fever. During the epidemic two cases of severe typhoid fever were seen by the writer in consultation in South Framingham.

Quinine was given in most of the cases, and with the usual success. Recurrent attacks, prolonged anæmia, enlarged spleens, and the other sequelæ were observed; but by far the greater number of patients recovered completely after a longer or shorter time.

As to the mode of introduction, the avenue by which malaria enters any locality, little can be said that is not more or less conjectural. The vehicle is probably water; but whether it descends in the form of rain or dew, or rises from the ground, or is drawn from springs or wells, we have no positive evidence to decide. It was remarked in the present instance that a large number of cases developed on the days succeeding two quite copious falls of rain. If this is the method of entrance, it may explain the apparent anomaly of the first appearance of malaria upon ground where no standing-water is seen.

But the source of the water which flows in the subsoil, or in the crevices of the strata of rocks, is something of which we know very little. "Barometric springs," as they are called, are found in New England, which in dry seasons suddenly burst forth, it is said, and flow in full volume many hours before the actual appearance of rain in their vicinity. Whence comes the vast body of water in the extensive wet quicksands underlying some parts of the county of Middlesex? It is believed by many that this water has a flow.

Competent authorities maintain that malaria enters the body in the drinking-water. If this is the case, a distant source of the springs that feed the wells may explain the appearance of malaria in a spot where neither of the so-called factors, namely, heat, soil-moisture and vegetable decay, can be shown to exist.

Of the various theories of the nature of the disease, that of Professor Cantani, of Naples, seems the most complete, if not the most satisfactory, of any. It is, that the malarial infection depends upon a parasite, once supposed to belong to the family of algæ. Tomasso Crudeli, Klebs, and especially Marchiafava,[1] have demonstrated the existence of a malarial microbe. It enters into the blood probably more readily by way of the digestive tract than by the respiratory organs. Unquestionably water is the surest vehicle of the infection, and drinking-water is the source from which arise the worst forms of the malady. No other mode of introduction gives such severe infection. It is quite uncertain if it ever enters by the air alone.

However it may enter the blood, the micro-organism finds its way to the spleen, which, under the stimulus of its presence, undergoes a disturbance of its nutrition and becomes enlarged.

In a person with normal spleen and healthy elastic capsule, the germs, entering this organ and multiplying in it, stimulate it until its contractile elements excited to action expel the blood into the general circulation, carrying with its stream the microbes which have collected. The reaction of the organism under the excitement of the presence of this ferment in the blood, produces chill, fever, and sweating. With the fever the germs are destroyed or are eliminated, and thus the access is ended. Then there is a pause, during

[1] Prof. Cantani, by thus discriminating, would imply that the claims of Crudeli and Klebs are no longer urged. Vide page 630.

which the germs may rapidly multiply and again excite the spleen to contract, or there is a stage of relaxation and rest, while the multiplication of the germs goes on until the exhausted spleen recovers its contractility again, and we have another expulsion of its contained blood, and another access of fever.

If the spleen is healthy and the capsule elastic, this may be repeated every day, the power of contraction being quickly restored; or with a less degree of sensibility we may have an interval of forty-eight or seventy-two hours.

It follows that the more perfect the sensibility of the spleen the shorter the intervals of rest; and in the quartan form, which is the most obstinate and rebellious, the stimuli become more powerful in their phlogogenic elements.

Thus the enlargement of the spleen in the chronic form of malaria is explained. In this form certain stimuli which act upon the liver may awaken the torpid contractile elements of the spleen, and produce fever. Thus, in those suffering with chronic enlargements, mountain air may cause an access. Certain errors in diet may do the same, especially the abuse of certain fruits; and it is suggested in this connection that some vegetables which ripen upon the ground, such as melons, may give rise to malaria by introducing the germs directly into the intestinal tract. The fever is perhaps the reaction of the body against an enemy which threatens life. An access of fever is fatal, as is well known, to many of the micro-organisms (witness the spirilli of recurrent fever). The fever is in this view a beneficent act of nature.[1] This is the theory of Prof. Cantani.

All the phenomena of the attack point distinctly to a nervous origin. A man in apparent health suddenly has a chill. His fingers and toes turn blue and cold, and shrink as if parboiled. The whole surface has a dusky hue. He complains

[1] Medical Clinic, Hospital Gesu e Maria—Monthly Supplement Gazetta degli Ospitali, Naples, June, 1885.

of headache, is sick at his stomach, and perhaps vomits. He cannot sustain himself, and lies down. Suddenly he is convulsed with a shudder so profound as to shake the bed, the room, and the whole house. The external application of heat gives no relief. While the surface is chilled the internal parts become hot. This goes on for an hour, two hours, perhaps longer. Here is every indication of a vaso-motor paralysis or inhibition, resulting in driving the current of blood upon the internal organs. Then follows a burning fever. The temperature mounts. The face becomes flushed, headache more violent, thirst intense, and great restlessness. The theory is pretty generally accepted that *fever* is due to some irritation of the nerve centres of heat in the medulla or in the spinal cord. Dr. W. M. Ord, in an address before the London Medical Society last year, gave a striking and ingenious explanation of the origin of pyrexia. In the process of growth, he says, heat disappears. This Dr. Ord demonstrated to his own satisfaction in a growing cucumber. Whenever the constructive processes are arrested or disturbed, heat is set free. In the destructive changes in the body it is known that heat is generated. Fever follows, therefore, whenever nervous force enters to disturb or interfere with the *constructive*, and also to increase the *destructive*, metabolic processes. The sweating stage must be dependent upon the same cause as the preceding chill and fever.

But the intermission, the sudden and complete cessation of all symptoms, almost compels the conclusion that the phenomena are of nervous origin.

Then with regard to the spleen. Experiments by vivisection have shown that the spleen is capable of undergoing great modifications in size by irritants applied to the medulla.[1]

[1] Ziemssen's Cyclop., vol. viii. p. 364.

Paralysing, or inhibiting, the splanchnic nerves caused the spleen to dilate. The volume of the spleen, of course, corresponds to the amount of blood it contains. The malarial infection may, either directly, or by acting as a ferment in the blood supplied to the part, or by stimulation even of the peripheral extremities of nerves, so irritate the medulla as to cause the spleen to dilate by reason of inhibition or paralysis of its nerves. The paralysis ceases and the spleen resumes its normal size, expelling the excess of blood.

This view does not, perhaps, differ irreconcilably from that of Prof. Cantani, as given above.

The modern views of the origin of disease, and especially the germ theory, compel us to recast our ideas of the etiology of intermittent fever.

Until a comparatively recent date it was considered, in spite of much contradictory evidence and some vague theories, that the origin of malaria in any locality was sufficiently explained, if heat, moisture, and vegetable decay, were present and active at the same time.

Now, however, there are found writers on the subject who do not hesitate to deny any and all agency of these factors in the production of intermittents.

The worst possible sanitary conditions cannot produce an epidemic of small-pox, nor can

> "All the infections that the sun sucks up
> From fogs, fens, flats,"——

generate a single case of intermittent fever; but the germs of these diseases being present, who will deny that the small-pox flourishes best in badly-ventilated houses and where people are filthy, or that malaria will show itself in greatest intensity in the vicinity of swamps and stagnant water.

The study of bacteriology is still in its infancy. The method of investigation seems thus far to have followed

only one direction. The cultures are made under conditions similar to those which exist within the animal economy, the germs being developed and studied under the microscope in connection with organic substances, generally animal, acting with heat and moisture.

But is it not clear that there must be modes of being, and probably stages of development, apart from the living animal body, and not dependent upon its blood-globules or albuminoids? Here is a part of the natural history of the microbe which requires notice. Unless we are willing to admit that that they may be bred autochthonously, we cannot escape the conclusion that the germs are in existence during the epidemic intervals. Some, it is true, may continue their growth in other organisms, animal or vegetable; but it is a matter of belief that some survive in the graves of the dead, some exist in wearing apparel, or houses, some in dust, and some again in water or floating in the atmosphere.

What causes the microbe to develop into activity at the time of epidemics is a curious and important question. All of them doubtless obey a law of *periodicity*. There is a time of rest when the germ or spore remains neutral and harmless, and again, the conditions being favorable, it develops into virulence. There is, however, in the human organism at the epidemic period some unknown receptivity awakened, when, probably by the law of natural selection, the germ received into the body produces the disease. But must we not admit also this *active state of the germ* at the time of epidemic outbreak?

If these views are correct, two agencies combine to cause an epidemic: first, the presence of germs in a state of active growth, and secondly, a condition of the human body which determines the natural selection. It is probable that neither of these could produce the effect alone, but that both must act together. Hence the statement that zymotic

diseases are maintained and spread solely by the contagious principle or germ, and "*that there are no other causes in operation,*" requires modification, since, besides a state of the body rendering it receptive, some condition, possibly telluric, must exist which awakes the morbific power of the free microbe.

With regard to the germ of malaria we may infer that we know something of its natural history in its free state, and apart from the pathological phenomena which it gives rise to. First, it is bred into activity by heat, vegetable decay, and moisture, in conjunction, probably, with light and air, and thus resembles organic life in general. Then it has weight and size, since it falls to the ground, is blown about by the wind, and arrested by obstacles. It requires stagnant water for its growth; it cannot live in running streams, nor in large bodies of moving water. It is destroyed by drainage and cultivation of the soil, and is stifled or rendered inert by being covered in as in building, and per contra it is liberated by opening up the ground. It is carried to and fro by fog and mist, and very likely by clouds and rain. These facts are not beyond question, but they are attested by countless observers in all countries.

On the other hand we know very little about the history of other disease germs except in cultures. And what do we learn from these? The distinction somewhat insisted upon by bacteriologists between saprophytic and pathogenic germs is not important in this connection, the object being to determine how these things develop when removed from all influence of organic fluids or solids. Equally useless to this investigation are efforts like those of Vogel to harmonize the processes of disease with those of fermentation by artificial methods.

Pleomorphism is the rule, and distinct morphological characters do not indicate necessarily specific differences, which are to be sought in the whole life-history of the

microbe. Dr. J. S. Billings says, "as we cultivate bacteria in different media we find a change in their form. It is possible that they may gradually change by alteration of the medium, of its chemical composition, or of its temperature." In artificial cultures in twenty-four hours the cocci are seen to have become rods, in forty-eight hours cocci-chains, in fourteen days zoogloea. Cocci transplanted again become rods. From the fusion of two cells arise, in another case, a host of potential cells each having all the powers of the original cells, which powers seem to reside in the nucleus, —"this cell nucleus possessing inherent properties which make it the one essential constituent of the cell itself."

We may assume, without much fear of contradiction, that the free germ or spore or nucleus (as the case may be) exists for an indefinite period in a dry, or at least an inert, state. Further than that we believe that some are made active by contact with filth, some by moisture, others again by heat, or by all of these combined. But beyond this we must wait for the investigations of those who are making this subject a special study. Dr. E. W. Cushing* has found that the bacillus tuberculosis cannot live in cultures at a temperature below 85° F. And yet there must be some mode or state of being of these organisms apart from the living animal body.

Looked at in this light may we not conclude that the malarial germ in its free state is more highly organized than other microbes? In a general way the statement may be hazarded that the malarial germ does not require the agency of the animal body for its development, whereas we can scarcely point to a fact in the natural history of other microbes proving their free and independent existence.

The pathological phenomena also indicate important distinctions between malarial germs and those of the zymoses,

* And others.

especially. In the first place malaria never, it is believed, acts by infection or contagion. The germ escapes from the body in an inert or harmless state. While it is the rule in zymotic diseases that the germ acquires increased virulence by residence within the body (at least until the "epidemic constitution," as it is called, has been exhausted), the malarial microbe, like the Giant Antæus, born of Neptune and of the Earth, expires, if its strength be not renewed by a return to the water and to the soil. Malaria, therefore, thrives in the open country, while zymotic diseases spread chiefly in cities.

Another frequent rule is that the receptivity of the body, its power of natural selection, is destroyed or diminished by the agency of the germ, a first attack preventing a second. Not only is this not true of intermittent fever or malaria, but it may be doubted if natural selection plays a very important rôle in the etiology of its epidemics, unless the fact of a periodicity in all diseases appearing before an outbreak of malaria be cited in proof of this.

Why malaria spares the colored races, which are so especially prone to attacks of infectious and contagious diseases, is a question which awaits further inquiry.*

In 1849, Prof. J. K. Mitchell, of Philadelphia, in a paper "on the cryptogamous origin of malarious and epidemic fevers," suggested a direction for the study of the etiology similar to that intended in this paper. His theory was admitted to be in harmony with the facts, but was never sustained by actual demonstration.

In 1866, it will be remembered that Dr. J. N. Salisbury declared that he had discovered the origin of malaria in the

* That an acquired melanosis of malarial origin, or that the protection against insect bites afforded by a dark skin, should be accepted as a sufficient explanation of the exemption of the colored races from malaria, seems to the writer to be not consistent with the facts, and not sustained by authority.

minute spores of certain species of palmellæ, which he found in great numbers in the saliva of those suffering from intermittent fever, and also in or upon marsh mud recently dried.

Others have followed in the same track without greater success. The spores or ovules of various cryptogamous organisms have been suspected. In all cases, however, it could be shown that these minute plants throve abundantly in non-malarious regions, and indeed wherever light and moisture were present. These plants cannot therefore furnish the germ, or essential factor, for which search is to be made.

What of the contagium vivum? Prof. Marchiafava and Dr. Celli claim to have discovered in the interior of the red corpuscles of the blood, in those suffering from malarial fever, minute organisms having amœboid movements, and which can be distinctly stained. These they term plasmodes of malaria. They are capable of transformation, by a process of fission, into granules not possessing motion. As infection progresses these bodies multiply, and are accompanied by an accumulation of pigment. The exhibition of quinine causes them to disappear or deprives them of all motion. They diminish as infection ceases. The intravenous injection of malarial blood will cause them to appear and multiply in the blood of the recipient. They are regarded as of a parasitic nature, and as belonging to the simplest class of protozoa. "As yet their pure culture outside of the body has not been effected, nor their natural source discovered." (Bos. Med. and Surg. Jour.)

The effort has been made in this paper, while covering the ground of what is believed to be known with regard to the malarial infection, to draw as near as possible to the borders of its "boggy Syrtis," and by the aid of the germ theory to throw light into the fogs and mists which now shroud it from view.

It may not be too much to claim, in conclusion—*First*, that water is almost certain to prove to be its habitat, and the vehicle by which this microbe enters the human organism; *Second*, that by new methods of investigation its life-history may be studied; and *Third*, these two points being gained, that it is possible to attack the free germ, or prevent its admission to the body, and thus the disease may be checked.

In the future undoubtedly new devices will be employed for the prevention of epidemic diseases. Thus far the only effectual method has been that introduced by Jenner and vaccination, namely, the exhaustion of the "epidemic constitution" in the human being. In most of the zymoses this factor is first in importance. But to prevent the development of epidemic virulence in the free microbe is probably in certain diseases of equal, if not of greater, necessity. In malaria, for example, may not this parasite be found and destroyed in its dormant, chrysalid, or nascent, state? May it not be sought and studied in water better than in the animal fluids? And, if this be admitted, there seems no clear and sufficient reason why our other senses, smell, taste, perhaps touch, aided by chemistry it may be, or possibly electricity or mechanical means, should not, in this simple element, help us in accomplishing that which, in the case of bacteria and bacilli, is only possible to the organ of sight assisted by the microscope.

ARTICLE XXXI.

ABDOMINAL CELLULITIS.

By JULIAN A. MEAD, M.D.,
OF WATERTOWN.

READ JUNE 8, 1886.

ABDOMINAL CELLULITIS.

The term abdominal cellulitis does not appear in the index of any medical work that I have consulted; and its analogue, pelvic cellulitis, is fast yielding to the influence of the modern analytical tendency, which divides and sub-divides each subject until the broad and distinguishing characteristics of the whole are overshadowed by the peculiarities of the part.

Without the least desire to call in question the great gain that this classification has conferred upon our profession, it has seemed to me that something perhaps may be learned by imitating the microscopist, who, by occasionally substituting the low power for the high, obtains a more comprehensive, if less minute, idea of the nature of the pathological condition under examination.

The abdominal cavity contains a large amount of what is known as cellular or areolar tissue. It surrounds and supports the various organs, and is distributed so universally throughout the abdominal cavity, that it is necessarily concerned in most inflammations, and is the seat of the chief changes that result.

This areolar tissue consists of loosely interlaced bundles of two forms of fibrous tissue, the white and yellow, with flattened connective-tissue corpuscle adherent to them, together with a great quantity of capillary vessels, nerves and lymphatics, and, in most places, fat.

According to Gray, the chief use of the cellular tissue is

to bind parts together; while, by the laxity of its fibres and the permeability of its areolæ, it allows them to move on each other, and affords a ready exit for inflammatory and other effused fluids.

This tissue when inflamed, whether in the abdomen or elsewhere, undergoes important changes. The essential changes that take place in inflammation have been satisfactorily demonstrated; the difference in the symptoms depends largely on the seat and intensity of the inflammation, and their variability is not a valid argument against the unity of the process.

The credit of the modern explanation of inflammation belongs to Cohnheim; it matters not whether or no we admit that a proliferation of the fixed corpuscles takes place as is held by Virchow, Von Becklinhamen and Stricher; the only satisfactory explanation of the phenomenon of inflammation is that afforded by Cohnheim's theory. As observed and stated by Cohnheim, the changes in an inflamed tissue are as follows. The vessels in the order of artery, capillary and vein at once begin to increase in size, the velocity of the blood, at first quickened, gradually diminishes, and the white corpuscles range themselves along the walls of the veins, where they move slowly along, tumbling over each other until they become stationary. On the outer contour of the walls of a vessel, usually a vein, in which the marginal layers of white corpuscles are well developed, is seen a small projection which enlarges in length and breadth, and becomes a rounded colorless lump. This again enlarges, puts out new pointed projections, and gradually withdraws itself from the wall of the vessel until it is attached to it only by a long narrow stem. Finally this attachment is broken and we see a colorless contractile body, with one long and several shorter processes, with one or several nuclei, in fact a white corpuscle. The white corpuscle in this way passes out of the vessel and becomes a

foreign body. The number of corpuscles that pass through a vein in a certain time depends upon the intensity of the inflammation; when, however, the inflammation is fairly acute, six to eight hours suffice to completely surround the veins and capillaries. Red corpuscles also pass through the walls of the veins and capillaries, but neither white nor red pass through the walls of the arteries. The liquor sanguinis soon follows, and the surrounding tissue is soon drenched with it.

The cardinal symptoms of inflammation, heat, pain, redness and swelling are readily understood and explained, if we bear in mind the above mentioned minute changes that take place in the vessels. The swelling, heat and redness are the direct results of the effused corpuscles and liquor sanguinis. The pain is caused by injury to or pressure of the nerves. The fifth symptom, impairment of function, is accounted for by the size of the exudation, and the lack of the usual nourishment.

Such an inflammation of the cellular tissue cannot occur without causing injury; the extent of which is proportional to the nature of the cause of the inflammation, and the degree to which its harmful influence is felt.

Inflammation ends in resolution, production or destruction. By resolution is meant complete absorption of the exudation, and restoration of the integrity of the affected part. This process begins as soon as the walls of the blood-vessels are restored to their normal condition. If the inflammation is mild, and the injury of the blood-vessels trivial, the cellular tissue is quickly relieved of the exudation which is taken up, partly by the lymph-vessels and partly by the blood-vessels. Should the inflammation be more intense and cause considerable exudation, and a slight destruction of the tissue, the process of resolution is more complicated; the fluid part of the exudation and the cells are absorbed as before, but the solid part of the exudation must become softened and

liquefied before the lymph and blood-vessels can take it away. This dead tissue, removed by the vessels, is, if not large in amount, replaced by a new and similar growth. Sometimes, indeed, the amount of this regenerative growth exceeds the original loss, and causes an hyperplasia of the diseased tissue.

Inflammation ends in production when the process is more intense than that which results in resolution, but not sufficiently intense to induce the formation of pus, and also when the circulation in the blood-vessel is not materially impaired. According to Ziegler the cells that form this new productive tissue, granulation or cicatricial, are the same white corpuscles that have passed out of the vessels.

The essential part of the formation of this new tissue is the existence of new blood-vessels, without which the tissue would not be produced or sufficiently nourished. Unfortunately all inflammations do not run the favorable course above described. Instead of resolution and production, there may be destruction. This happens when the nutrition of the inflamed tissue is cut off by the stoppage of the vessels on which the tissue depends for its support. The more abundant and more cellular the exudation the more likely is the inflammation to end in destruction. Billroth says, as the inflammation progresses the entire inflamed part is finally changed to pus, that is, to fluid tissue, consisting of cells with some serous intercellular fluid which is mixed with shreds of dead tissue. The tissue surrounding the purulent collection is filled with cells and is very vascular; anatomically it closely resembles a granulating surface lining the whole cavity.

If the exudation softens and becomes liquid rapidly, it forms an acute abscess; if slowly, a cold abscess. The course of inflammation has been described somewhat in detail, because it will assist to a more intelligent understanding of the nature of the inflammatory process that takes place

in the cellular tissue of the abdominal cavity. This pathological change is practically the same, whether the seat of the disease be near the cæcum or kidney, in the abdominal wall or in the fascia behind the peritoneum. Its course and its results may be and undoubtedly are influenced by the surroundings, but the inflammation goes steadily on to resolution, production or destruction with the formation of pus.

As in diseases of the kidney it is not uncommon to find one type complicated by another, and the most important symptoms obscured by the prominence of the complication, so we shall find that an inflammatory process of the cellular tissue does not in every case run a typical course. The symptoms will show that complications exist which, while they do not change the nature of the disease, modify its course and influence its manifestations.

It is generally admitted that an abscess which originates in the abdominal wall, in the sub-peritoneal cellular tissue or in the region of the loins, and is totally unconnected with disease of bone, or with ulceration of the bowels or with child-birth, is not a very common occurrence.

Dr. Gurdon Buck says that suppuration may take place in the iliac fossa behind its fascia, unconnected with caries of the lumbar vertebræ or pelvis or morbid lesion of the cæcum or colon. The same writer describes the true post-fascial abscess originating in the iliac fossa from idiopathic inflammation of the cellular tissue, as follows: It presents itself in a chronic, more rarely in an acute, form, and locates itself in either the right or left iliac region. It is most frequent in adult age. The tumor which it forms rises up from the hollow of the ilium, pushing before it the fascia and outer half of Poupart's ligament, so that the crest of the ilium and the anterior superior spinous process can no longer be grasped between the thumb and finger. The outer half of Poupart's ligament is rendered tense and un-

yielding, and a deep seated induration may extend two or three fingers' breadth below it. The precise limits of the swelling can only be appreciated by the touch and by percussion over its abdominal portion ; upon the surface the eye perceives only a fulness or a diffuse swelling of those parts.

Of seven cases, in only one was fluctuation unequivocal. In all except one the thigh was retracted and attempts to straighten it caused pain.

The phlegmonous character of the swelling, its anatomical relation to the iliac. fossa and Poupart's ligament, the absence of disease of the lumbar vertebræ and the co-existing retraction of the thigh, these points being clearly made out, are sufficient to warrant the conclusion that suppuration has taken place in the fossa behind the fascia.

Oppolzer divided the inflammatory process in the region of the cæcum into perityphlitis and paratyphlitis, the former being limited to the peritoneal envelop of the cæcum and appendix vermiformis, and the latter to the post-peritoneal and post-cœcal connective tissue. This is a refinement in diagnosis that is not warranted by actual experience. A preponderance of certain symptoms, viz.: the pressure symptom in the right lower extremity; the flexed thigh; formication, numbness, pain, and sometimes paresis of the right leg; dysuria, and retraction of the testicle, and pressure upon the iliac vein inducing thrombosis, show that the tissue behind the cæcum has become affected, but these symptoms do not limit the disease to this locality. In a majority of cases the peritoneal covering of the cæcum and the vermiform appendix participates in the inflammation. An English writer says that there is reason to believe that this malady is often passed over unrecognized, and is of more frequent occurrence than is supposed. This is said to be the case in children, in whom cases of iliac abscess around the cæcum are liable to be mistaken for hip-joint disease, though with perhaps scarcely sufficient reason.

This disease is generally secondary to some affection of the cæcum, but also arises from perinephritic and psoas abscess, vertebral caries, septicæmia, and external injuries such as blows, kicks, or severe compression.

In the admirable Letters to a Young Physician by Dr. James Jackson, mention is made of a painful tumor near the cæcum. Dr. Jackson located the pain and tumor on a horizontal line connecting the two anterior superior spinous processes of the ilium at the point where this line intersects the right margin of the rectus muscle on the right side. This tumor is felt on deep percussion. Sometimes it is superficial. Marked tenderness on pressure exists within a circumscribed space over the tumor. According to Virchow, the tumor may be as large as a man's fist, but as a rule it is much smaller. Dr. Jackson frankly admits his inability to form an opinion as to the precise seat and nature of this affection. It is clear, however, that he described what is known as perityphlitis, that is an inflammation of the connective tissue around and behind the cæcum; the accuracy of his localization and description is borne out by modern research.

The nature of this affection has been described in the beginning of this paper, and an intelligent explanation given of the swelling, pain and nervous symptoms. The gradual disappearance of the tumor in one case, and the formation of an abscess in another, was accounted for. The same treatment, viz., rest, poultices, opium, and an early opening of the abscess, that has been found beneficial in inflammations in other localities, is indicated here for the same reason. Opium and incision of the abscess should be resorted to early, on account of the danger of rupture into the peritoneal cavity. The value of opening these abscesses is shown by contrasting the sixty-seven cases, mostly treated without incision, with a mortality of forty-seven and a half per cent., reported by Bull, of New York, in 1872, with the

one hundred cases treated by operation, with a mortality of only fifteen per cent., reported by Noyes, of Providence, in 1883.

Another favorite seat for abdominal cellulitis is the loose connective tissue around and behind the kidneys. This affection has received the name, from its location, perinephritis. The inflammatory process generally begins in the connective tissue behind the kidney. Perinephritis, like perityphlitis, is generally secondary, but it may be primary.

In the earlier stages the cellular tissue behind the kidney is congested; later, as a result of the exudation of the white corpuscles and liquor sanguinis, it becomes solid and firm. This congestion causes from the first pain and tenderness. When exudation has taken place a hard tumor appears in the lumbar region which, if the inflammatory process continues, becomes soft and fluctuating in the middle, and generally more distinct and superficial.

The inflammatory process may stop short of the formation of pus, and the swelling may gradually disappear. The inflammation is then said to have terminated in resolution. Trousseau in his Clinical Medicine mentions several cases that resulted in this way. If the inflammation goes on to suppuration the tumor should be explored, and the pus, when demonstrated, should be at once removed. An early incision is desirable, as it may anticipate an unfavorable burrowing or pointing of the abscess.

Local inflammation of the cellular tissue may occur in the abdominal walls unconnected with disease within the cavity, and may terminate in suppuration. Such abscesses are generally the result of an injury, and are usually found near the umbilicus. The absence of urgent symptoms referable to the abdomen will distinguish these abscesses from the peritoneal abscess. An effort on the part of the patient that makes the recti muscles tense, such as raising the trunk or forced expiration, will protrude the superficial

and obscure the deeper tumor. These abscesses require but little treatment, and the prognosis is generally good. In case they are connected with and dependent upon some intestinal trouble, the progress and treatment depends on the extent and nature of the intestinal disease. Dr. Howell, of England, reported a case of a man with a small, hard tumor, about the size of a hen's egg, lying over Poupart's ligament, about midway between the external and internal abdominal rings. After two days the tumor began to soften, and an incision was made and four ounces of pus were discharged. On the following morning two worms were found in the poultice. Fæces passed by the wound for three weeks. The man recovered within two months. After confinement it is not uncommon to find an extra-peritoneal abscess in the inguinal region. To quote Dr. Coale, its most frequent seat is where the aponeurotic covering of the deep abdominal muscles going to the thigh passes into the fascia transversalis and Poupart's ligament. Examination by the rectum and vagina rarely affords any information. In course of time the abscess extends upwards towards the inguinal region, where its presence soon becomes manifest. Here, as in other cases of abscess, an incision should be made as soon as its situation is obtained, and the pus removed.

The foregoing are some of the favorite seats of abdominal cellulitis. The experience of the members of this Society will prove that the list has not been exhausted. Perhaps some of those tumors of the abdomen whose character is obscure, and which do not belong to the so-called phantom tumors, nor to that class that disappear after a good cathartic, may be examples of inflammation of the cellular tissue of the abdominal cavity. It is certain *a priori* that a tumor may appear wherever there is cellular tissue, and an exciting cause for inflammation, and that, while the physician, somewhat in doubt as to the nature of the swelling, postpones

aspirating, it may by the process known as resolution gradually disappear. Such a tumor, when the result of chronic inflammation, might simulate a malignant growth and suggest a prognosis entirely unwarranted by the nature of the case, and its subsequent course. If the pathological condition is recognized, and the changes in the inflamed tissue understood, the prognosis becomes more certain, and the treatment more effective. Should the tumor tend to resolution, general treatment, together with morphia to relieve pain, and poultices to assist the resolution, will suffice. But when pus is suspected or actually demonstrated, an effort should be made at once to remove it either by aspiration or incision.

The object sought in the preparation of this paper has been to call attention to the frequency of abdominal cellulitis; to show the unity of its course in different parts of the abdomen; to suggest the possibility of mistaking it for other diseases; to explain the nature of the disease, and to point out the necessity of an early evacuation of the pus.

ARTICLE XXXII.

THE CAUSATION AND TREATMENT OF LATERAL CURVATURE.

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OF BOSTON.

READ JUNE 9, 1886.

THE TREATMENT OF LATERAL CURVATURE.

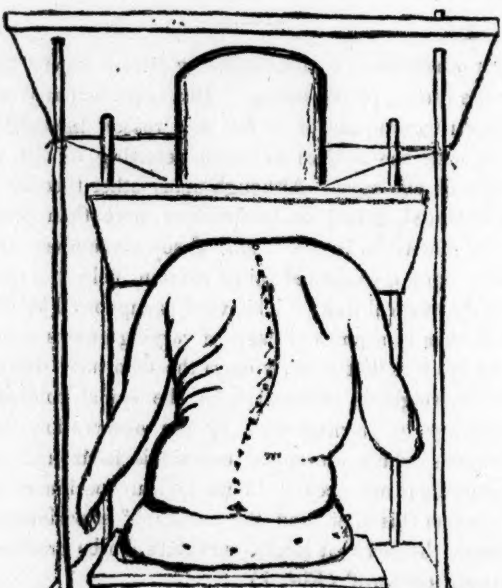
THE principles of treatment of any disease depend largely upon the theory of causation. This is particularly true of lateral curvature, and it is for this reason impossible in dealing with the subject to avoid referring to the vexed question of etiology. Although many other theories have been advanced, it may be accepted as more than probable that the distortion is the result of superincumbent weight pressing upon a weakened spinal column, held in a position out of the vertical line. This view is supported by clinical facts as seen in a series of cases of varying grades of severity; by the fact that in early cases the deformity disappears when the weight is removed from the spinal column (by recumbency or suspension); by the observation that in quadrupeds where the spinal column is horizontal lateral curvature does not occur.[1] Pathological specimens would also confirm this view, and the results of experiments demonstrate the fact that lateral curvature can be produced by downward pressure[2] (Fig. 1).

No better illustration can be furnished than the accompanying specimen from the Warren Museum, which shows the effect of weight falling upon a weakened skeleton. The lower extremities and the spinal column have bent under their load, while the long bones of the upper extremity, which have no weight, have remained straight (Fig. 2).

[1] Berl. Klin. Wochenschr., May 17, 1886.
[2] Boston Medical and Surgical Journal, March 16, 1886.

That weight rarely falls in a vertical line on the spinal column an inspection of figures in action makes evident (Figs. 3 & 4), as well as an examination of the exact modelling of the antique statues, notably the Borghese Achilles, the Farnese Hercules, the Dying Gladiator, the Germanicus. In fact the spinal column is rarely, if ever,

Fig. 1.

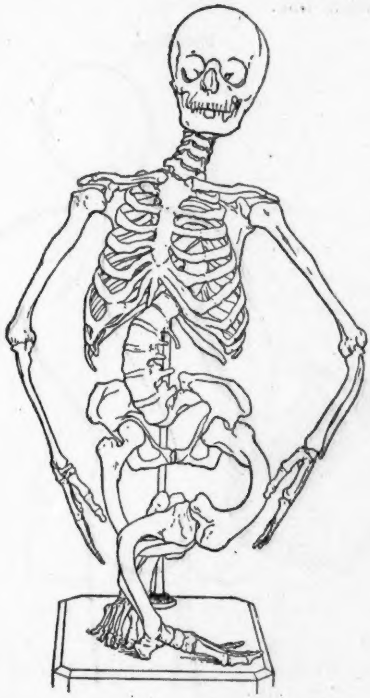


in a vertical position; and the superincumbent weight would induce a deviation to the right or left, varying in extent in different attitudes. Whether the curve should be a long upper with a short lower curve, or the reverse, or compensating curves of equal size, will depend partly upon the

favorite attitude, and partly without doubt upon the power of resistance of certain parts of the spinal column.

The treatment of lateral curvature should vary according to circumstances of the case, and largely according to the stage and degree of the affection. It is manifestly as irra-

FIG. 2.



tional to encase in a stiff corset, certain to promote muscular atrophy, a trunk dropping to one side from a want of muscular development, as to attempt to correct a fixed curve with osseous change by muscular exercise. Cases should be treated according to the indications. Bearing in mind

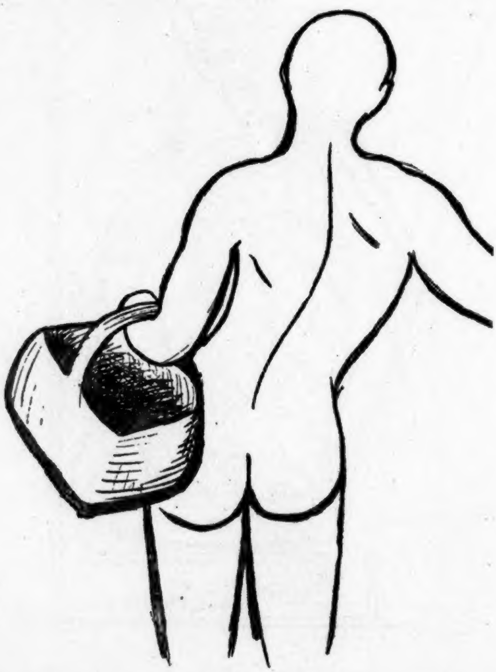
the factors which cause the distortion, the aim of treatment would be,—

1st, To remove the superincumbent weight.

2d, To develop the strength of the structure of the spinal column.

3d, To keep the spine as far as possible from deviating from the vertical line.

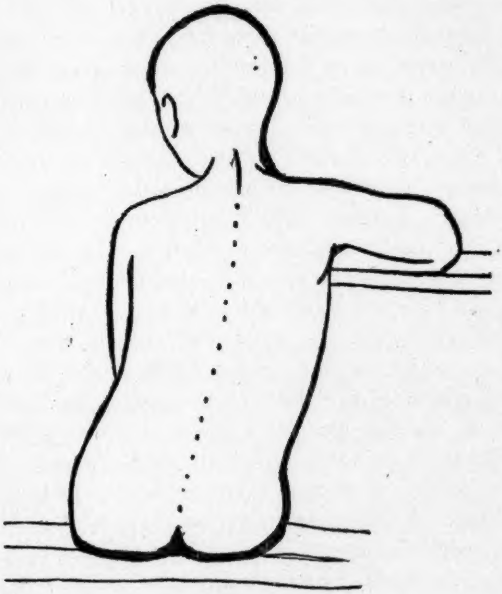
Fig. 3.



The two means for accomplishing the first are recumbency and suspension, and they can only be employed as adjuncts. For it is manifest that it is impossible to make quadrupeds of patients, or to imprison them to a couch during the grow-

ing years, or until danger of the yielding of the spine has entirely past. Suspension is evidently only of temporary assistance. Little or nothing can be done by drugs in the way of strengthening the tissue of bone. The distortion, however, is essentially one of childhood, beginning in the majority of cases at from 7 to 10 years of age,[1] and in the

FIG. 4.



process of growth the bone will gradually develop to the normal strength. A great deal, however, can be done towards maintaining a proper position of the spinal column, and it is in this direction that the chief efforts in treatment should be directed.

[1] Eulenberg (Die Seittiche Rüchgrat's Verkrümmungen, Berlin, 1876). Ketch, New York Medical Record, April 24, 1886.

There are three methods worthy of consideration, viz.:

The postural,
The gymnastic, and
The mechanical.

The postural treatment is that method where correction is sought by instruction in proper attitude. As a raw recruit is taught the position and carriage of the soldier, so children are to be drilled into standing and walking erect. This method is suited for the simplest cases. To be thoroughly carried out, it requires that the patient should daily be exercised in walking, standing and sitting properly for a specified time under the direction of some competent person. The back should be bared, and any deviation from the proper position in standing, sitting and walking should be carefully noticed. When resting during the hour of drill the patient should remain incumbent. After the drill is over such precaution should be taken as will prevent the persistence for any length of time of a faulty attitude. This should not be done (out of the drill time) by constant correction, but by the proper arrangement of the play hours, a supervision of the chairs when reading and studying. Walking, running and active games should be encouraged. Reading, except in proper position, should be discouraged. A certain amount of time should be given to proper rest of the back. A fruitful source of faulty attitudes in sitting is furnished by the chairs, which, not fitting the child or supporting the back properly, induce the patient to sit sideways, the trunk being supported on one tuberosity of the ischium and on one elbow. The chair which the child is to sit in for any length of time should be narrow, and not deeper than the length of the thighs or higher than the length of the legs; its back should not be above the shoulders and should be arched so as to fit in the hollow of the back; or if this is not practicable, hard cushions should be placed on the back of the chair, so fitted as to act as a

proper support. An ordinary steamer chair, furnished with a swinging book-rest, gives an excellent and ready means of reading without great danger of improper attitude. In school it should be seen that the seats are not too far from the desks nor too high; and foot rests should be fitted for both feet. Counteracting a tendency to sit sideways, the desk or table should be near enough to the chair to prevent lounging. Children at home are usually expected to sit in chairs made for adults, and the chairs do not as a rule fit properly. In cases where great care is needed, chairs suitable to age and size of the child should be furnished.

It is not so easy to prescribe rules for the avoidance of faulty position in standing as in sitting, when the chair in a measure regulates the attitude. Standing with the weight chiefly on one leg probably results more as a matter of habit than from a unilateral muscular weakness; when it becomes habitual and instinctive it is with difficulty corrected. Under these circumstances the child should not be restricted in walking or active play, which give a constant change in attitude, but should, so far as practicable, be prevented from standing for any length of time.

The usual bad habits of position are as follows: standing on one leg, at too low a table, sitting in a twisted position, sleeping always on one side with too high a pillow for the head.

In most early cases the faulty attitudes are clearly the result of muscular weakness. The growth in size has not been accompanied by a corresponding development of muscle. This condition is frequently met in rapidly growing children, and is one of the most common causes of lateral curvature. Here proper gymnastics are indicated, but they should be prescribed and carried out with much care. In cases of gravity, the children are unable to bear much exercise without fatigue. Those exercises, therefore, chiefly needed in correcting the deformity, should be the only ones

prescribed. The usual class-work of the gymnasia is to be avoided, as such cases require the individual attention of a competent person who will see that no faulty position is taken during the exercises.

Mr. Bernard Roth, of London, has devoted much time and attention to the development of proper simple gymnastics, combined with postural treatment, the efficiency of which he has demonstrated by a series of successful cases. He has pointed out that in each individual a certain attitude can be voluntarily assumed by the patient, which is the nearest approach to the normal. This attitude varies to a degree in each case. The first step in treatment should be to determine this position, which he calls the "key note" position. All exercises should be made in such a way as to develop the muscles involved in this attitude, or while the attitude is maintained. The following are the exercises which he prescribes, varying in a measure in individual cases:—

1. Lying on the back, arms by the side, hands supinated, very slow deep inspirations by the nose, expiration by the mouth.

2. The same, with arms extended above the head.

3. Position the same as No. 1, head rotation, lateral flexion of head.

4. Position the same, simultaneous circumduction of both shoulder joints from before backwards, elbows and wrists extended.

5. Position the same, one hip circumducted both ways (knees extended).

6. Lying on back, simultaneous extension of both arms upwards, outwards, downwards, from a position of the elbows flexed and close to the trunk.

7. Lying prone, one hip circumducted both ways, knee kept extended.

8. Sitting on couch, with the back at an angle of 45°,

ankle circumducted in, up and out, while the toes are inward the whole time.

9. Lying on back with arms extended upwards by the sides of the head, flexion of both arms (surgeon resisting). (The patient's knees, flexed over the end of the table, fix the trunk.)

10. Patient astride a narrow table, with the arms down and hands supinated, trunk flexion at lumbar vertebræ (patient resisting), followed by trunk extension (surgeon resisting).

11. Patient, with arms extended upwards, leans against a vertical post with pegs on each side; these he grasps. The surgeon gently pulls the patient's pelvis forward by his hands on the sacrum (patient resisting), also pelvis rotation on its axis to right and left alternately (surgeon resisting), with the hands on each side of the pelvis.

12. Lying on back with head and neck projecting beyond the end of table, the head is gently flexed by the surgeon's hand on occiput (patient resisting).[1]

One merit of the method of posture and exercise is its simplicity and ready applicability by every practitioner. There is great danger of making the matter appear unduly complicated, and this is the case if an attempt be made to differentiate the different bellies of the individual muscles, on the convexity of the different curves. The fact of the matter is that the curves are the result of static laws, and that the muscles are only at fault in so far as they do not hold the trunk erect, and thus allow the superincumbent weight to fall unequally. The muscles chiefly engaged in keeping the trunk erect are the large ones of the back, the latissimus dorsi, with the trapezius and the erector-spinæ.

It is not a difficult matter to devise simple and practicable exercises to develop these back muscles. The strength

[1] British Medical Journal, May 13, 1882; and also Walsham, St. Bartholomew's Hospital Reports, vol. xx. 195.

of a patient's back muscles can be determined in a ready way by attaching a cord to the front of a cap tied to the head, and fastening this cord to a spring balance. The patient, seated at the proper distance from the spring balance, held firmly by an assistant, is directed to bend backwards keeping the back straight so far as is possible, and the amount of the pull is indicated upon the dial.[1] A record of this registers any increase in the strength of the patient, and as a clinical fact it will be found that an improvement in carriage will correspond to an improvement in the indicated strength.

The round shoulders of growing children present a typical illustration of what is termed flexible curves (Fig. 5). The deformity is clearly an exaggeration of the normal physiological curve, and due to muscular weakness of the muscles which would hold the head erect, to which is usually added a lack of tone of the muscles holding the scapulæ back, viz., the trapezius and serratus.

Round shoulders may also be secondary to the curve in the hollow of the back, lordosis, *i. e.* the arching back of the body, which is seen in the effort to rest the spinal muscles, weak from any cause, by balancing the weight of the trunk. This is particularly noticeable in Duchenne's paralysis.

Scoliosis, lateral curvature proper, is not due primarily to muscular weakness, but, as has been shown, is the secondary result of a back imperfectly supported and of improper attitudes, which are due frequently to muscular weakness, which latter presents a rational indication for treatment.

The management of cases of this sort may be described in a general way as follows:

After a careful inspection of the deformity, diagnosis as

[1] By fastening a spring balance to the wall, and an arrangement with pulleys and cord connected to straps fastened to the patient, the actual amount of force in different movements can be estimated.

to the flexibility of the curves, and examination of the faulty attitudes, the child's height and weight should be taken and a comparison made with the standards established by Bowditch's tables, in order to determine whether any excess of growth in height or deficiency in weight existed. It should

FIG. 5.

be considered that if a child has grown with unusual rapidity, or if the height had increased without a proportionate increase of weight, greater care should be exercised in the management of the case. The patient should then be directed and taught to sit and stand and walk in as nearly a normal position as possible, and be drilled to assume this

position. It should be the object of the attendant to see that all exercises taken during the exercise hour should be done without an assumption of a faulty attitude. The exercises assigned should vary in each case. In addition to those already mentioned the following will be found of use:

1. The patient sits facing the assistant who holds a strap passing about the patient's occiput (prevented from slipping by a cross strap around head and chin). The patient bends forward and back, keeping the spine straight. The backward movement is resisted by the assistant.

2. Same as above, except the straps cross the shoulders.

These exercises may be carried on with a weight and pulley, or rubber exercising tubes instead of the resistance of the assistant, but the amount of force is less readily regulated. The assistant should correct any arching of the back.

3. The patient stands facing a wall at arm's length from it; places the left hand upon the wall at the height of the chin, the hand being in a direction across the body. The patient, supported by the arm, slowly brings the face towards the arm, bending at the ankles, keeping the whole body in line; the face should be turned so that the left ear touches the hand, and the standing position slowly resumed, the body being still kept from bending at the hips.

4. The patient stands with the heels, back and occiput against a projecting corner (of furniture or doorway), and places the elbows (the arm being flexed) as far back as possible.

5. The patient, seated on a stool or chair, should place the feet behind, and on the inner side of, the front legs of the chair, and slowly bend sideways; the assistant, resisting on the head, determines the strain on the muscles of either side.

For children accustomed to stand upon one leg, the best exercise is to drill them to stand upon the other for a speci-

fied number of minutes, and standing on one leg to lower and raise the body, bending at the knee.

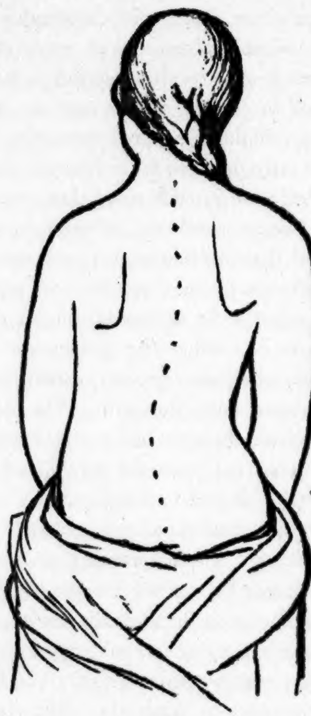
In almost all flexible cases, and in a majority of cases with commencing osseous curves, all the treatment that is required is postural or gymnastic, thoroughly carried out. In certain cases of this class, and in most of the severer cases, treatment by some mechanical aid is needed. This help is indicated in curves which may be considered as threatening, even if flexible, for gymnastics and postural supervisions are only possible for a limited time during the day, and it is desirable in such cases that at no time should faulty positions be assumed. It should, however, always be borne in mind that mechanical supports are injurious in so far as they take the place of muscular support, and therefore defeat the object to be arrived at in an ultimate cure. They should never be used to the exclusion of gymnastics.

A great variety of spinal supports, corsets and appliances for this purpose have been devised. The chief defects of most of these are that besides being cumbersome, they are not fixed in their bearing upon the pelvis, and allow the patient to lean to the side and to assume faulty positions.

If a patient with a flexible lateral curvature be examined, it will be found that in endeavoring to push the spine straight, pressure will be exerted on the right side of the back, a little below and behind the axilla, and counter pressure in the front of the trunk, upon the pelvis, just below the anterior superior spine (Fig. 6). It will also be necessary in some cases to push the right shoulder down, and to pull back the right shoulder blade. Sometimes also it is desirable to push up the left shoulder. These points vary necessarily in different cases, but in the typical lateral curvature with the upper convexity to the left, they are as here indicated. Mechanical support and pressure should therefore be in this direction, and as far as possible there should be no support or pressure at any other place, and

motion in every other way should not be limited, that free play of the muscles be allowed for their development.

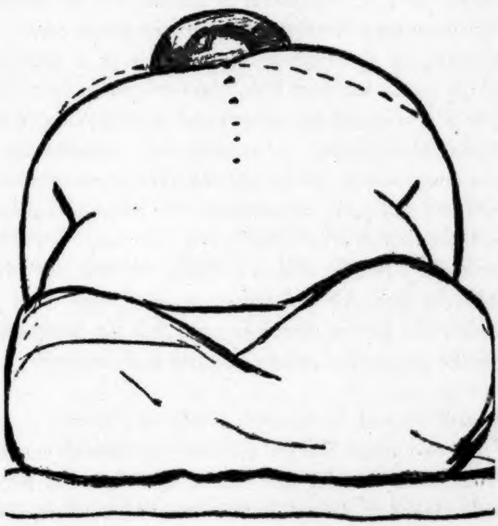
Fig. 6.



In cases of pronounced fixed curves with marked change in bone, the matter is a different one. This condition of the spinal column is readily recognized by the facts, that the curves do not diminish when the patient is recumbent or suspended, and that rotation is indicated by projection of the ribs when the patient bends forward (Fig. 7).

In these cases a cure that is a complete correction of the deformity is not to be hoped for; in some severe cases an arrest of the increasing curves is difficult, and all that can be done is to relieve the symptoms presented, as far as is possible. In many of these cases, plaster corsets, applied with the aid of suspension, are of assistance; or better, leather

FIG. 7.



glue or silicate corsets, made from casts of the trunk in an improved condition, are of great help. Ordinary stiff corsets, or any support which constricts and steadies the trunk, will often relieve the symptoms of pain in aggravated cases.

Some of these cases are also relieved by gymnastic exercises, massage and electricity.

Two errors of prognosis are common in regard to lateral curvature:

1. To regard the affection as of little moment, and likely to correct itself.

2. That the affection is one of immediate gravity.

The latter view is less frequently entertained, and is due to a confusion of the disease with caries of the spine, but the former error is quite wide spread.

In a majority of cases of scoliosis, the curvature becomes self-limited, and a slight twist of the spine is of no great importance. This may be said of most of the diseases of childhood, but it is impossible to predict that an increase of the curvature may not take place in any given case. It is certain that no spontaneous rectification of a pronounced lateral curvature has ever been observed, while a progressive increase to a stage of permanent and incurable disability is, unfortunately, not rare. Instances are occasionally seen where a curve which has occasioned little or no trouble during girlhood and early womanhood, increases and gives rise to much discomfort after middle life. It may therefore be said that every patient with a laterally curved spine, even if not suffering from the deformity, is in danger from it of discomfort and partial disability, and that the danger is the greater the poorer the patient's health and strength.

The subject may be summed briefly as follows:

Of the two chief factors determining lateral curvature, superincumbent weight and faulty attitudes, the latter in the early stages of disease is the one which offers feasible indications for continuous treatment.

Faulty attitudes can be corrected by properly directed gymnastics and by drill.

After pronounced osseous curves have been formed, a complete correction is difficult or impossible.

Gymnastics are of great help in correcting any tendency to increase of the deformity.

The gymnastics should be carefully prescribed and efficiently carried out daily.

Proper appliances may be required, but they should be

regarded as an adjuvant to gymnastics, and as a means of retention in severe cases.

The affection is one which is easily prevented, but cured with difficulty, and treatment cannot be begun too early.

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ARTICLE XXXIII.

THE ETIOLOGY AND TREATMENT OF THE SUMMER DIARRHEA OF INFANTS.

By HENRY C. HAVEN, M.D.
OF BOSTON.

READ JUNE 9, 1886.

THE ETIOLOGY AND TREATMENT OF THE SUMMER DIARRHEA OF INFANTS.

According to the United States Census of 1880, Massachusetts has a percentage of total deaths under one year to aggregate deaths, of 21.99; the lowest State but one, Pennsylvania.

Massachusetts has a percentage of total deaths from diarrheal diseases to aggregate deaths of 7.83, only four out of the thirty States ranking lower: yet in this same State in 1884, there were 2,089 deaths from Cholera Infantum; and in the twenty-two years from 1863 to 1884, 40,006 infants died from the same cause.

These figures only partially show the total mortality from diarrheal diseases under one year; for according to the State Registration Report, the number of deaths in Boston from Cholera Infantum in 1884 was 504; while by the fuller report of the Boston Board of Health, the number of deaths in infants from *diarrheal diseases* was 710; a difference of 206.

Table A shows the percentage of deaths from the different miasmatic diseases for the two periods of the five years 1880 to 1884 inclusive, and the forty-three years ending Dec. 31, 1884. It will be seen that Cholera Infantum heads the list with a percentage of 5.42 for the last *five* years and 4.82 for the last *forty-three* years; Typhoid Fever being its nearest neighbor with percentages of 2.54 and 4.23, respectively.

Of the twelve most prominent causes of death at all ages in Massachusetts for the twelve years from 1875 to 1884, only two diseases, Pulmonary Consumption and Pneumonia, outrank Cholera Infantum.

TABLE A.

PERCENTAGE OF DEATHS IN MASSACHUSETTS FROM SPECIFIED CAUSES, FOR FIVE YEARS, AND FORTY-THREE YEARS.

Causes of death. Miasmatic Diseases.	Percentage of all deaths.	
	Five years, 1880 to 1884.	Forty-three years, ending Dec. 31, 1884.
1. Smallpox	0.07	.52
2. Measles	.50	.75
3. Scarlatina	1.33	3.51
4. Diphtheria	3.69	2.37
5. Cerebro-Spinal Meningitis	.41	.23
6. Quinsy	.06	.08
7. Croup	1.54	1.94
8. Whooping Cough	.67	1.02
9. Typhoid Fever*	2.54	4.23
10. Erysipelas	.62	.69
11. Metria (Puerperal Fever)	.31	.22
12. Carbuncle	.04	.02
13. Influenza	.05	.17
14. Dysentery	.93	3.03
15. Diarrhœa	1.31	1.24
16. Cholera Infantum	5.42	4.82
17. Cholera	.27	.51

* Including "Fever," Typhus Fever, Continued Fever, and Bilious Fever.

Of the five most destructive causes in children under five years of age, for the five years from 1880 to 1884, Cholera Infantum again leads with an annual total of 2,081 out of 11,961 deaths; the next most fatal cause being Pneumonia with but about one third the number, 705.

This enormous yearly loss of life from a disease which is admitted on all sides to be preventable, clearly proves one or both of the following propositions to be true.

1. Our knowledge of the causes of the "summer diarrhœa" of infants is not sufficiently complete to enable us to prevent or successfully cope with the disease.

2. There is a lack of appreciation of, or inability to arrest or modify, the action of the known causative and exciting influences.

Both of these propositions I hold to be true, but believe the second to afford the explanation both of the frequent occurrence of the disease, and the great mortality caused thereby.

It is not my purpose to attempt any statement as to the pathological conditions existing in this disease; they are different and of differing severity. In the present state of knowledge regarding these changes,—especially the microscopic ones,—a classification of intestinal diseases in infants, founded on pathological anatomy, is unsatisfactory. The clinician meets with symptoms of varying severity, associated with inconstant pathological changes. Slight lesions only, or none at all, are found in cases where life has been terminated by the severity of the attack; and on the contrary a severe inflammatory condition of the intestine may have been evidenced by only slight symptoms of intestinal disturbance during life.

Nor do I wish to touch on the vexed question as to whether certain or all forms of diarrheal disease in infants are caused by a specific germ or germs; this is still *sub judice*, and foreign to the intent of this paper.

The summer diarrhea of infants is a clinical entity. It is the Cholera Infantum of the laity, a name, unfortunately, still widely used by physicians. Although apparently more exact, this term is in reality (as at present used) less so than the term which is coming into more general use—Summer Diarrhea. This term, although a symptomatic one, gives a tangible synonym for a group of constantly concurrent phenomena, for which we may seek the common exciting causes,—and so far render our treatment more rational,—while awaiting more exact knowledge as to the *ultimate causes*.

By the term Summer Diarrhea then, I mean practically the same that our State and City Health Boards mean by Cholera Infantum; and in studying its occurrence in Massachusetts, all cases of fatal diarrhea in infants under one year of age *should be* included. The following figures show the propriety of the application of the descriptive term "summer" to the disease. Of the 40,006 deaths above mentioned, 35,962 occurred in June, July, August and September, and of the remaining 4,044, 2,411 occurred in October; undoubtedly sequelæ of summer cases in most instances.

The question of identity in cause and nature of the diarrheal diseases, occurring during the summer and at other seasons, does not come directly under discussion.

To return to our first proposition (our knowledge of the causes of Summer Diarrhea of infants is not sufficiently complete to enable us to prevent or successfully cope with the disease), we can only demonstrate its truth or falsity by reviewing what is at present known in regard to the ultimate and exciting causes.

It will, I think, be universally admitted that in its totality it is a zymotic or fermentative disease. It is so classed by all statisticians, but the question as to its ultimate cause must be held in abeyance till the knowledge is acquired which shall determine this, not only for the disease under discussion, but for the group of allied diseases.

There are three conditions, or sets of conditions, which of late years have been generally considered proximate causes, or co-acting sets of causes.

A. Atmospheric and telluric conditions;—the air temperature being best established in its causative relation.

We must accept the fact that the great increase in diarrheal diseases comes *always* in the hot season, *i.e.* a continued high temperature inevitably brings in its train an enormous increase in the infant mortality from these diseases. This is a matter of popular as well as of scientific

knowledge, and a high air temperature, either alone or acting in conjunction with other causes, or again, other causes or conditions *in themselves*,—whose appearance and disappearance, however, are *synchronous* with the increase of temperature,—must be admitted as an exciting factor or factors.

It is necessary here to mention that it is a most difficult matter to determine, not only how much effect as a cause the heat in itself,—*i.e.* apart from other co-existing atmospheric or telluric conditions,—may have; but also in what way it exerts its influence. Does it produce the disease simply by its direct effect on the individual's nervous system, as some claim; instancing the resemblance to thermic fever, which is often striking; or, through its depressing influence on the nervous system, does it render the individual more susceptible to other causes; or, again, does it act simply through the inducing of fermentative or other changes in the food, which in their turn cause the disease?

This last series of questions are somewhat outside of the inquiry at hand; but to enable us later to discuss rationally the proper treatment, an opinion, so far correct as possible, must be formed.

There can be little doubt but that heat *does* act in these three ways to produce this disease, and to secure the most satisfactory prophylaxis or cure, the extent and nature of its influence in any particular case should be carefully estimated. The fact that the disease occurs so much more frequently in bottle-fed children points strongly toward the *principal* effect of the heat being in its influence on the food; although the fair reply may be made to this, that the artificially fed class are less well nourished, and moreover are constantly exposed to the irritation from the presence of imperfectly digested or irritant matters, that the depressing effect alone of the heat is enough to allow this

constantly present cause to take effect; again, if heat kills simply through inducing fermentative changes in the food, one would expect a single hot day to be followed by an increase in the mortality,—which is not necessarily the case.

I have studied by the graphic method the relations between the daily mortality and the daily mean of the air temperature, the barometer, and humidity, but have not been able to demonstrate any stable relations between them to the mortality; although a rising temperature with a falling barometer often appears in conjunction with an increased mortality.

I have not been able as yet to formulate any law as to the relation borne between the *daily* temperature and the daily mortality, other than that which we already know, that it requires a high temperature,—say 65° to 70° F.,—for a certain length of time to produce its effect.

The date of *inception* of the attack in a large number of cases is necessary, in order to make any deductions of much value. I have not thought it worth while, therefore, at present to reproduce these studies.

B. Urban residence. A second condition which meets with general acceptance as a necessary factor is Density of Population, which, as a rule, is only found in cities and large towns. The following quotations from authors illustrate the views which are at present held, so far as I know, by all writers on the subject, whether English, Continental or American.

Dr. Eustace Smith, in his "Practical Treatise on the Diseases of Children," makes the following statement as to the causation of "Choleraic Diarrhea": "It is especially a complaint of warm weather, and summer heat must be looked upon as a powerful predisposing cause of the disease. Other agencies, however, must come in as exciting causes, for the affection is not common in country places, and indeed is rarely seen out of cities."

Meigs and Pepper in their book, "Diseases of Children," say of "Entero-Colitis,"—"the most active causes of the disease are the heats of summer, residence in large cities,—and this includes higher heat than residence in rural districts,—with greater density of population and more copious filth emanations and improper alimentation."

Dr. J. Lewis Smith, in "Diseases of Infancy and Childhood," says "that 'Cholera Infantum,' or as it is sometimes called 'Choleriform Diarrhea,' is a disease of the summer months, and with exceptional cases, of the cities."

Dr. Louis Starr states, in regard to its etiology, that, "like entero-colitis, it is a disease of cities, finding its victims chiefly among those that live in poverty and squalor."

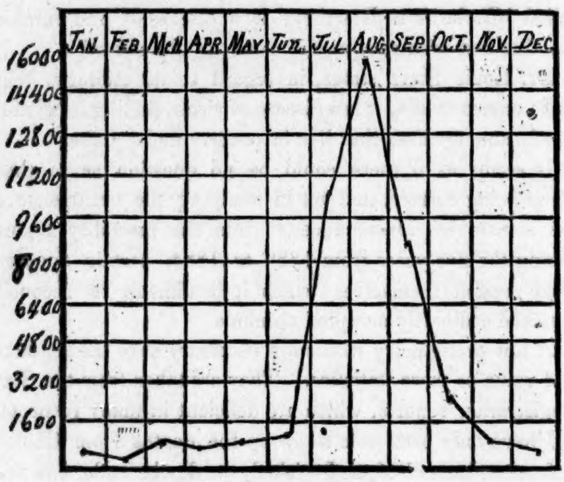
It seems as if there could be no question as to these views being correct, and yet in studying the occurrence of the disease in Massachusetts from the mortality reports during the five years from 1880 to 1884, certain apparent facts present themselves which it is difficult to reconcile with the ordinarily accepted opinions.

A few preliminary words are necessary as to the character and value of these statistics. They are taken from the State Registration reports, which are deficient in many respects.

I have only been able to group the deaths from Cholera Infantum, instead of, as I wished, the deaths under one year from all the diarrheal diseases, the latter being nowhere accessible. I have assumed, however, that a death registered from Cholera Infantum must at least be a death caused by a diarrheal disease in an infant. To just the extent that this assumption is not correct, the conclusions are invalidated; but it seems to me it must be only in exceptional cases, that a death from Cholera Infantum does *not* mean a death from a diarrheal disease; and such exception again might as well occur in city as in country. That Cholera Infantum in Massachusetts is practically the same disease that we have under consideration, is shown by the chart, which gives

the curve by months of the mean State mortality for twenty-two years. The curve, in the city and country, is presumably the same, although the registration reports do not give the data for constructing graphic curves which will verify this statement.

CHART OF DEATHS FROM CHOLERA INFANTUM IN EACH MONTH FOR TWENTY-TWO YEARS (1863 TO 1884), MASSACHUSETTS.



January,	161.	July,	10,745.
February,	139.	August,	15,908.
March,	198.	September,	8,363.
April,	197.	October,	2,411.
May,	290.	November,	4.53.
June,	945.	December,	195.

It must be constantly borne in mind, that mortality statistics are not infallible guides as to the relative *frequency* of occurrence of any given disease; it is, I think, a fair assumption that a relatively greater number of children in the country than in the city, would *survive* an attack of summer diarrhea, so that the same number of deaths, *on*

the chances, in an equally populous city or country district, would represent a larger number of *occurring cases* in the latter, *i.e.* the country.

It is certainly a matter of absolute knowledge that in hundreds and hundreds of cases a change from a city to a country residence, even if but temporary, is enough to effect a cure. But it must not be forgotten that in the great majority of such cases, there is a simultaneous change of food as well.

Still another point must be recognized;—that all, or *nearly* all, of the most vicious conditions of city life, may be present in a single tenement house in some mill-town of perhaps only a thousand inhabitants; we may have, that is, the heat, the dirt, the over-crowding, the bad drainage and the artificial feeding, which are the concomitants of city life among the poor; and such conditions may occur over and over again throughout the State.

Statistics are invaluable, but almost any thing can be proved by them, unless they are thorough and thoroughly studied, and I consider these I am about to quote *suggestive* only. To appreciate the true bearing of such statistics as are given in the registration reports (provided in the first place they had been carefully collected and verified), one must know:

1st. To what extent the other admitted causes than urban residence prevail in one and another part of the State; as, for instance, artificial feeding, which the social condition of the inhabitants renders more common in one town than in another; the local temperature, etc.

2d. The relation of the population to the geographical area; *i.e.* the number of inhabitants per square mile; and moreover if within any one square mile there are any one or more centres where many of the evils of the over-crowding of the city exist; and if so, what proportion of deaths occurs in these centres.

3d. The relative *mortality* from the disease in one and another section; *i.e.* the relative *occurrence* of the disease,—for, granted a common cause or set of exciting causes, their action *may be* entirely separate from the causes which induce a high mortality. We can easily imagine a larger number of cases of any diseases with less deaths resulting in one of two localities. Scarlet Fever, for instance, may result from a common source, and affect an equal number of children in two families. The previous health, the hygiene, the social condition, the nursing and the treatment affect the mortality in the two families, though the cause was common.

To return, however, to the statistics of the mortality in Massachusetts. On studying the number of cases occurring in every town in the State during the five years from 1880 to 1884, I find such apparently contradictory facts, that, without a more definite knowledge of the *exact* cause of death and of the differing conditions prevailing in the different towns, it does not seem safe to draw any deductions from the statistics.

TABLE B.

	Population, census of 1880.	Deaths from cholera infantum.	Deaths under one year.	Births.	% of deaths from chol. infantum to 1000 population.	% of chol. infant. to deaths under 1.	% of cholera infantum to births.
Nantucket,	3,727	504	2288	11,372	2.14	22.09	4.41
Boston,	362,839	8	20	57	1.66	40.00	14.00

In many of the smaller and even the smallest towns, the number of cases of Cholera Infantum bears a higher percentage to the population, to the births, or to the total deaths under one year, than in Boston. As, for instance,

in Nantucket, in 1884 (the population being that of the census of 1880).

This striking difference occurs in many towns throughout the State; while again in 1884, we find eight towns of a population of over 3,000 without a single death registered from Cholera Infantum.

I will only call attention to one table which seems of some value. The figures of population are those of 1880, which brings in an element of inaccuracy.

TABLE C.

ANNUAL AVERAGE FOR THE FIVE YEARS—1880–84.

	Population (census of 1880).	Deaths from cholera infantum.	Deaths under one year.	Births.	% of deaths from chol. infantum to 1000 of population.	% of chol. inf. to deaths under 1 yr.	% of cholera infantum to births.	All deaths under one to births.
Seventeen cities,	892,077	1320	4816	26,479	0.14	27.4	5.3	18.1
Rest of States,	891,088	712	2639	19,723	0.08	26.9	3.6	13.9
Towns of 15000 to 5000,	331,644	307	1167	8,757	0.09	26.3	3.5	13.3
Towns under 5000 (country districts),	559,364	404	1472	10,965	0.07	27.4	3.6	13.4

I have compared the deaths from Cholera Infantum with the population, with the births, and with the total deaths under one year, in the three following groups:

[1] Seventeen cities, with a population of over 15,000, a total population of 892,077.

[2] The towns of 15,000 to 5,000, a total population of 331,644.

[3] The towns under 5,000 (country districts), a total population of 559,364.

In this table, several rather startling figures meet the eye. It is seen that in the percentage of Cholera Infantum deaths to population, the country has only one half that of the city; but the per cent. of births in the city are higher, being 29.6 in 1,000, against 19.6 in the country district, so there are more infants in the 1,000 to die. In the per cent. of Cholera Infantum deaths to total deaths *under one year*, they are *identical*, 27.4. In the per cent. of Cholera Infantum deaths to births, the country shows the best, but even here not as well as the towns of 5,000 to 15,000 population. In the per cent. of all deaths under one to births, the cities show the worst; but the towns of 5,000 to 15,000, and all those under 5,000, show a very slight difference, and that *against* the country.

That is, these figures, as far as they go, show that while the prevalent opinion is correct, that the city is less healthy than the country for babies (for some reason), inasmuch as 18.1 of those born, die under one year in the city, against 13.4 in the country; and as, moreover, 5.4 infants under one year die in 1,000 of the population, against 2.4 in the country,—more than twice as many,—they do not verify the ordinarily accepted opinions as to the relative frequency of "Cholera Infantum," in the two districts compared, as a cause of death in infancy.

In the towns of 5,000 to 15,000, in every comparison the country is at a disadvantage, except in the percentage of deaths of Cholera Infantum to population, 0.9 and 0.7 respectively; the births to population, moreover, are higher, —26 to 19.6,—so that relatively to the population there are more babies to die of any given disease in 1,000 living persons in the towns than in the country.

How far these apparent facts will be corroborated by the further study I hope to make, is uncertain. They are offered for what value, if any, they may possess.

C. The Third Cause, Artificial Feeding.

There is a consensus of opinion as to this being one of the necessary factors in the great majority of cases. It is not easy to get exact statistics; indeed I know of none published in this country which show the feeding statistics of the infants dying from summer diarrhea in this country.

In Berlin, Baginsky found in the four years from 1879 to 1882, among the children dying from diarrheal diseases in the periods of January and February, and June and July, the following figures, they being the annual averages of the four years:

Jan. and Feb.		*June and July.*	
Breast Fed.	Artificially Fed.	Breast Fed.	Artificially Fed.
19.7	277.	69.5	1479.7

During the last two years I have treated at the West End Nursery and Infants' Hospital two hundred and twenty-four cases of diarrhea occurring in infants under one year; in twenty-four cases the disease was a second attack. Of the two hundred infants, only thirty-three were breast fed, or

	No. of cases where history known, 203.	No. of cases of over 10 dejections in 24 hrs. (severe cases).	Per cent. of severe cases.	No. of deaths.	Per cent. of deaths.
Breast,	36	6	16	0	
Mixed,	98	31	31	4	4.0
Artificial,	69	22	31	6	8.7

16.5%. Of this thirty-three again, in sixteen the attack was *probably* due to the alteration of the mother's milk

produced by menstruation, and in ten the diarrhea was a complication of Rachitis, Pertussis, or Bronchitis; leaving only seventeen uncomplicated cases out of the two hundred, who had had no artificial food, and *good* breast milk. A closer inquiry would much diminish this number, as mothers of the poorer class do not consider "a taste out of the hand" or "a drop of tea" worthy of mention.

If it were *realized* that yearly, that Herodian instrument,—the Bottle,—slew not only its thousands but its *tens* of thousands, I cannot believe that its abuse, which in nine cases out of ten is its *use*, would be so lightly considered in any Christian community. Millions of these death-traps are yearly poured into the market, inviting seductively the mother to the ease, which ignorantly she knows not is more deadly than the "quieting medicine" she later procures from the same source. A bottle, a long tube, and a supply of one of the numerous "perfect substitutes" for mother's milk, which are everywhere obtruded on her notice, and the city baby, who does not go "out of town" when "everybody" goes, stands a good chance of going "out of town" and under ground in one and the same trip.

This language may seem extreme; let him who deems it so visit the tenement houses of the North End, or treat, at an out-patient clinic, sick babies during the heat of a city summer, and I venture to think his opinion would be modified, and his adhesion to my second proposition secured.

Treatment.

[1] *Preventive.* [2] *Curative.*

Recognizing as we must the practical impossibility of modifying climatic and social conditions to such an extent as to negative, to any considerable degree, the influences of heat and urban residence (so far as the latter prevails as a factor), the third cause, ***artificial feeding***, remains; and

this seems to me the most possible of modification in its ill effects.

A great deal can be done, and a good deal has been done, to modify the effects of the two first-named conditions. Witness the fresh air spaces, marine parks, sea shore homes, and open air excursions; the education of the masses, by personal and public instruction, in the matter of the personal hygiene of the infant during the summer, etc.

The awakened interest in every land in the vexing problem of social science, which relates to the condition of the poor,—their housing, their education, and how they can best be helped,—must ultimately lead to results which will improve the physical conditions of the infants of the poor. But after all, and in spite of all, I fear the city must remain, with its wheels of progress yearly crushing out like those of the car of Juggernaut myriads of infant lives. The heat of city life, as a fire, sucks in from all its surroundings that nomadic element which is the most degraded and least stable, and hence offers least resistance to its draught. We may lift up and educate the poor, and improve their physical and moral condition, and by our very acts we help make room for others to fill their places from below. It has been said, and I doubt not with truth, that it is impossible to find a healthy child, whose ancestors for two generations have been born and lived continuously in London.

Many philanthropists who favor the erection of the large, so-called "model" tenement houses, do not recognize, it seems to me, the inevitable increase of mortality among infants which comes from the aggregation of people in large numbers, however thorough may be the sanitary arrangements; as compared, that is, with small and isolated tenements or houses. I believe that this is one reason, why in Philadelphia,—the second largest American city, but where the tenement house system is practically unknown,—the difference in infant mortality is so striking. In 1878, out of sixty

American cities, Philadelphia had the lowest per cent. (17.97) of deaths under five years, to aggregate deaths; Brooklyn, 47.80; New York, 45.95; Boston, 39.16.

But the world moves, and there is now forming a nucleus of public opinion which will in time enable our sanitary authorities to do,—what they stand waiting to do,—wipe out the human rookeries that stud every city, and give to the infant more of that chance of life and health, which a modern civilization demands for but does not give to it.

In regard to the third factor, artificial feeding, a great deal could be done if its importance as a factor were more fully recognized, or less easily forgotten. It seems to me a grave responsibility for any one's assumption, to advise weaning in the case of a child, who must, as an alternative, be bottle fed during the summer in the city, or, although to a less extent, in the country. Yet not once but many times have I known of women, who at an out-patient clinic, or in private practice, have been advised to wean their babies; women without constitutional disease or taint, but simply run down, and I have seen the secondary sickness or death of their babies ensue. It is a matter upon which even many mothers do not seek medical advice, but accept that of some other woman. It has often seemed to me, looking at it from the child's side, that we do not recognize sufficiently its right to a careful consideration of *its* interests in deciding the matter.

A baby in a well-to-do family, with good hygienic surroundings, can be bottle fed with apparently little danger, though it is not a question even here to be lightly decided; but certainly a poor baby has as good a right to its life as a rich one, and in giving an opinion, even if a free one, it should not be lightly uttered or without a full recollection of its possible import. Even if but a little breast milk can be given by the mother it is infinitely better to furnish additional food for nourishment, for in time of danger breast milk, however poor, is a sheet anchor of dietetic treatment;

except in those rare cases where it is found difficult of digestion. But this method involves more trouble to the mother than complete weaning, and is hence comparatively seldom followed.

The social condition of the poorer classes of course determines largely the question of artificial feeding; but still if as many children died of small-pox in a year as of Diarrhea in the three summer months, I believe *some* means would be found to secure vaccination, even if it were as expensive as good breast milk; and a society to help them secure its benefits would be amply supported, but small-pox is contagious and threatens the *public* health. I do not believe that one is a *much* surer protection against small-pox than the other against cholera infantum; nor is the first any more fatal a disease, or more serious in the injury inflicted on the system in case of recovery than the latter.

Where artificial feeding is resorted to, as it must be in many instances, there is here a great opportunity for preventive measures, public and private, but my time is too short to admit of their discussion. The inspection of the milk supply; the production of a milk suitable for infant feeding, constant in a composition which is definitely known to mother and physician,—a milk which is brought to the consumer *fresh*, not 36 to 48 hours old (and this is entirely feasible); the supervision of infant boarding; the education of the mothers in the necessary knowledge of principles, of which the first is absolute cleanliness; these are some of the ways in which prevention can be secured.

A more thorough appreciation of the necessary *details* of infant feeding; the power of observation which enables each child to be individualized and its individual necessities met, would aid still more; and it is in these latter ways that I believe the profession can greatly reduce the existing mortality from, and the frequent occurrence of, Summer Diarrhea.

It takes time and patience to convince a stupid uneducated woman of the importance of these facts, but she does not *want* her child to die; and once convinced, she will stay so, long enough at least to improve materially her child's chance for life and health.

[2] *Curative Treatment.*

The disease is not strictly a self-limited one, but the reparative power of Nature is so great, that in the vast majority of cases when the causes cease to exist or to exert their influences recovery speedily ensues, if the stage of collapse has not already been reached; and the earlier in the disease that this action, and the results of these causes are annulled or modified, the more satisfactory will be the results of the treatment.

FIRST CAUSE.

HEAT=THERMIC FEVER.

- **Cardiac weakness=circulatory disturbances.**
  - ***e.g.*** **Pulmonary congestion.**
  - **Secretory disturbances.**
  - **Cardiac failure.**
  - **Collapse; death.**
- **Irritability of nervous system.**
  1st stage, over action (excitation).
  2d stage, paresis (depression).
  - **Lack of control of heat regulating centres.**
  - **Lack of control of vaso-motor system (sympathetic).**
  - **Serous diarrhea, great loss of fluid from vomiting and diarrhea, resulting rapidly in inspissation of blood, embarrassing cardiac action and nutritive activity, with imperfect emunction, great and sudden loss of weight; impairment of vital force.**
  - **Increased reflex activity in conjunction with the above result, opens the way for irritative fever from presence of irritant matters in digestive tract.**
- **Increased metabolism of tissue, wasting and loss of vital force, with probably imperfect emunction, and possibly auto-inoculation with resultant products of imperfect oxidation.**
- **Diminished digestive power; renders more probable reduced nutrition, and occurrence of imperfectly digestive matters which may act as local irritants.**

How can we modify these causes and their results? To answer this most important question, let us analyze the several *results* of the different causes. The analysis here given

is not presented as being capable of physiological and pathological demonstration in every instance, but as an exposition of the symptoms present,—singly or in combination,—with a reference to the probable or possible cause and as illustrating the most important points for therapeutic attack.

SECOND CAUSE.
URBAN RESIDENCE. (?)
- Increase of heat and hence increased activity of first cause.
- Bad hygienic surroundings.
  - Vitiated air { Poor in oxygen. Rich in micro-organisms (specific germs?).
    - Depressant gaseous or particulate matter: *e.g.* human exhalations, sewer gas, smoke, etc.
    - Depressing vital force, furnishing ferments for putrefactive and fermentative changes in food, if artificial food used.
  - Lack of air.
  - Poor food supply; old and adulterated milk, increasing effect of third cause.

THIRD CAUSE.
ARTIFICIAL FEEDING.
- Impaired nutrition (increased by lack of good food supply); diminished resistance to other exciting causes.
- Fermentative (acid) and putrefactive changes.
  - Local irritation of gastro-intestinal tract.
    - A catarrhal condition; impaired digestion or absorption; diarrhea; inflammatory changes; fever, diarrhea, loss of water, impaired nutrition, etc., as before mentioned, reflex action increased.
  - Absorption of toxic chemical substances; poisonous and depressant effect on nervous system.
  - Effect of pathogenic micro-organisms. (?)
- Chemical Composition.
  - Difficult digestion, mechanical irritation of intestines, and formation of "by-products" acting as local irritants; or depressants if absorbed.
  - Disordered digestion and nutrition, a catarrhal or inflammatory condition with results as before mentioned.

Any one, or a group, of the conditions spoken of in the above may of course exist due to some other cause or causes; a child who is suffering from a slight catarrhal intestinal

trouble, the result possibly of a cold, is just so much the more susceptible to the other causes; a child with a weak circulation is again more exposed than a similarly situated child without such defect.

The treatment then is to be governed on the general principles of therapeutics, which can be determined by glancing at the above symptoms.

These children die not of the local conditions, but of collapse, heart failure, nervous prostration, or later of malnutrition, which ends in heart failure.

If we can prevent the occurrence of these conditions, infants will not die as they now do by the hundreds and thousands.

Fever, cerebral irritability, or exhaustion, the rapid loss of fluids, cardiac weakness, and innutrition, rapid or slow, the local irritation or inflammation, where it exists, are the enemies to be conquered, and there is nothing more startling, more sudden in its onset, and more necessitating rapid skilful treatment than the combination of these conditions sometimes met with; a disease with almost justifies the name it bears,—Cholera Infantum.

Medicine directed to the more evident local manifestations of the disease is comparatively unimportant, and unnecessary in the light cases; and if used alone, time wasted in the severe ones.

Fever, the arch enemy of the infant's organism, I believe to be the most dangerous symptom, when present to any considerable degree. The fever may be primary or secondary; in the first class of cases it seems to be more frequently of purely nervous origin, the intestinal symptoms, often choleraic in type, appearing simultaneously or shortly after, and being probably purely nervous in their origin.

In the second class of cases, as a rule slower in their progression, the symptoms can be traced back to a simple dyspeptic catarrh, which has gone on to an inflammatory

affection, either enteritis, gastro-enteritis, or entero-colitis; the fever gradually increasing, with finally as a rule a sudden increase and a sudden exacerbation in the severity of the attack. It is important to determine to how great an extent local inflammation of the intestinal tract exists, by careful inquiry and inspection of the discharges, as a guide to local treatment.

For treating the fever, I do not believe there is any method so safe, so sure, so scientific, or so speedy as abstraction by water. This remedy is always at hand, its action is under perfect control, and can be stopped or modified at any moment. It relieves the irritability of the nervous system; it supplies through the skin the water that has been lost from the intestines, and thus relieves the heart. It causes derivation to the skin, which can be intensified by the addition of rubefacients; this again relieves the heart and internal organs, by restoring the equilibrium of the circulation. It spares the stomach and intestines from the additional irritation of an antipyretic drug. Antipyrine, hypodermically or by the mouth, may prove its equal. It is certainly the best substitute we have at present.

I have seldom found it necessary to use the bath. The infant being stripped and laid upon a blanket, is packed in a sheet wrung out in water at a temperature of say 95° F., and every five minutes an alternate sheet wet in water which is gradually cooled is substituted. As a rule, in half an hour, with a reduction of the water to only 70° F., a fall of from 2° to 4° C. has taken place. It may be necessary to lower the water to 60° F.; seldom lower.

The reduction is not as permanent as with antipyrine, and the process needs frequent repetition. During the heated term in the city, I have sometimes kept infants in the pack for days, with most satisfactory results. I recall one case of particular severity, when the baby, wrapped only in a sheet, was sprinkled from a watering pot, every

hour, day and night, for several days. Whenever this was omitted he became restless and irritable; the temperature immediately went up, and the vomiting and diarrhea returned. He was kept in the pack for a number of days, and made a perfect recovery.

Even when the fever is not marked, great relief often follows from this method to the nervous irritability, and the thirst which is so distressing; often not even a tea-spoonful of water can be retained to alleviate it. Even if shortly vomited, however, the continued administration of water to supply that lost from the intestines, until the diarrhea is checked, is of the utmost importance. There is always in the earlier stages considerable irritability of the nervous system, which it is important to control, and theoretically opium is the most suitable agent. Opium has been made the bugbear of the children's doctor. There is no doubt that it is a drug that must be used with caution; but it is a most valuable one if so used.

In *the early stages, or before an approach to the state of collapse*, opium is a most important adjunct to treatment. The bromides will often take its place, but their action is slower, and possibly in the end more depressant. I believe, however, that opium should be given for its general effect, and not for a local or "astringent" effect, if it has any such.

We need not fear the added responsibility of making habitués of our patients at this early age.

The heart is the point on which our attention should be fixed, and by its condition should the question of stimulation be depended. Too early or too abundant stimulation is worse in a baby than in an adult, for the heart is more sensitive and more easily over-driven. But for that same reason, stimulation is absolutely essential in the severe and rapidly prostrating cases of this disease. The study of the pulse and auscultation of the heart are necessary to an in-

telligent judgment as to the time and amount of use of alcohol and of digitalis and other cardiac tonics and stimulants. Digitalis is a drug which is of great value not only in this, but in all diseases of infancy accompanied by cardiac weakness, if employed rationally.

There is nothing more *irrational* and probably often disastrous than *routine stimulation* in infants, and yet I fear stimulants are often used in this way.

Nutrition must be kept up, if possible, on account of its influence on the general condition. The question of dietetics, therefore, must be considered from this standpoint as well as from that of local treatment of the intestinal tract. The principles of dietetic treatment are simple and rational, and yet are frequently ignored or forgotten.

The food may be the initial irritant, either from changes which may have occurred in it previous to ingestion, as acid fermentation or putrefactive change, or subsequent to ingestion, as farther fermentation, incomplete digestion, etc.

The substances resulting from or accompanying these changes may act mechanically or chemically as irritants, causing hyperæmia and a catarrhal condition; the acid fermentation of the mucus,—which is secreted in an abnormal amount, as a result of this irritation, and readily undergoes fermentation,—intensifies the acid condition of the intestine resulting from the food fermentation; this acid condition causes farther local irritation of the intestine, and may also act as a reflex irritant on the terminal nerves of the intestinal surface. The indications are just as strong to put the irritated or wounded surface at rest, as in case of fracture of the bones, and the continued administration of food requiring for its digestion or absorption the functional activity of the parts affected, is as irrational as the rubbing together the ends of a freshly fractured femur.

To just what extent it is necessary to limit the quantity and quality of the ingesta is a matter for decision in the in-

dividual case; but the principles of dietetic treatment remain the same, whether in a slight case of dyspeptic catarrh, we merely limit the amount; or, in a severe case of entero-colitis, we withhold all food requiring any digestive activity on the part of the intestinal tract.

Believing, as I do most strongly, that the fermentative changes in the milk, which is a fluid undergoing such changes with the greatest rapidity, is the most important etiological factor, the first step is to withhold it entirely for a longer or shorter period. The nutrition will not in acute cases, in previously fairly nourished children, suffer sufficiently to over-balance the great benefit derived from such abstention. This is often the only treatment necessary or desirable in the slighter cases of diarrheal diseases in infants, with a cathartic of castor oil, or rhubarb and soda, or calomel, to clear the bowels of offending matters, and the administration of an alkali to neutralize the acidity of the intestines. If it is necessary to resume or continue the administration of food, such preparations should be selected as can be absorbed without further digestion or very readily undergo it. The success of many patented nostrums depends simply on this, that simultaneously with their use, milk is dropped from the dietary. Sugar, the most important element in infantile nutrition, can be given in simple solution. Albuminoids, as white of eggs, or fresh beef juice; or the two may be combined. Barley water, a very easily digested and absorbed starch, may again furnish the necessary sugar, or we may employ one or another of the different malted foods which are practically sugar, and a very good kind too, *i.e.* one that does not easily ferment. Fat can be dispensed with for a considerable time if necessary, or may be given by inunction; or later, in almost infinitesimal doses of some *sweet* emulsion of cod liver oil. The child's peculiarities must be studied. Routine dietetic treatment is unsatisfactory. All changes to the more

nutritious and ordinary forms of diet, especially those containing cow's milk, must be made gradually, avoiding a sudden change of either quantity or quality; oftentimes ten drops of milk is as much as it is wise to give in a meal of an infant recovering from a diarrheal disease. My time is too short, however, to attempt any description of details which are undoubtedly familiar to you all, but the importance of which has seemed to me not always to be fully recognized, and an attention to which would result in a very perceptible diminution of the mortality from "Summer Diarrhea."

The use of an alkali is an important point in the treatment of all cases characterized by an acid condition of the intestinal tract. An alkali may be given for three purposes, and should be administered differently according to the effect desired.

1. To stimulate secretion of gastric juice.
2. To render the coagulation of the albuminoids of cow's milk less dense, and thus make the digestion easier.
3. To neutralize the acidity of the intestinal tract.

It is often given for this latter purpose, and it should be remembered that, when this is attained, its further administration is needless, and may be harmful. Alkalies are given freely not only to children, but to adults, without professional advice,—witness the enormous consumption of "soda mint." In children alkalies are not harmless. Jacobi has uttered timely warning in regard to their too liberal administration.

The condition of the dejecta then should be watched to determine the time when the object of their use has been accomplished; often a diarrhea is continued simply by the too long continued use of an alkali.

In the choleraic type of the disease, we often have an alkaline condition of the alvine discharges, probably the result of functional nervous disturbance. This is an indication for the use of acids.

The choice of an alkali is a matter to which considerable importance is attached. Personally I prefer the soda salts, believing them to be less depressant than the potash. Where there are gastric symptoms, the benzoate has seemed to me to have a better effect, especially on the vomiting. If there is evident irritability of the nervous system, the bromide of soda is often advantageous. For the ordinary case, salicylate of soda seems to me better, as being probably possessed of some anti-fermentative power. I think it will be found that most of the drugs depended on in the treatment of this disease, as bismuth, oxide of zinc, creosote, or carbolic acid, calomel, resorcin, etc., have a decided anti-fermentative action; this may be the explanation of their undoubted value.

Antisepsis of the gastro-intestinal tract is an initial and necessary adjunct to treatment.

To Summarize.

It is to be remembered that the alimentary canal is outside the body, and if irritated or influenced is to be treated, so far as possible, on the same principles as we would treat a wound.

Quiet it by rest first, through its relations to the system at large; if other conditions render it proper, by opium, bromide, or other sedatives, avoiding a depressant effect.

By rest locally through dietetic treatment and local treatment if necessary, to restore it to its normal *alkaline* condition, and to soothe the irritated and inflamed condition if present. Antisepsis of the gastro-intestinal tract, so far as possible, to prevent the presence of chemically irritant matters, or absorption of morbific agents. If such matters are still present, their removal by suitable agents.

Treat the general condition, recognizing the *physiological* cardiac weakness in infancy, and making its support and the stability of the nervous system the ends to be attained.

In case of serious loss of fluids from the system, this must be in *some* way replaced. It is easy to cure the disease, if you can keep the infant alive while you are doing it.

I have made no attempt to mention any one drug, or combination of drugs, or to offer any routine prescription, believing that in this as in all diseases, where no known specifics exist for their remedy, the physician succeeds best who recognizes the *principles* of treatment, and uses those drugs with whose action he is most familiar, and can hence use most intelligently.

Routine prescription has seemed to me even more common in treating these diarrheal diseases of infants and children than in any other class. No attempt is often made to localize the intestinal disease from a systematic study of the symptoms and discharges; or to differentiate between the symptoms caused by a local irritation of the intestine and a force acting through the nervous mechanism, and utterly unconnected perhaps with any local condition.

To treat the latter with the measures adapted for the former will yield only disappointment.

A moment's reflection will, I am sure, convince any one that such a course is not only unscientific but dangerous.

Massachusetts Medical Society.

PROCEEDINGS.

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Massachusetts Medical Society.

PROCEEDINGS OF THE COUNCILLORS.

October 5, 1881.

A Stated Meeting of the Councillors was held in the Hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Wednesday, October 5, 1881, at 11 o'clock, A.M.

The President, Dr. H. W. Williams, in the Chair.

The following Councillors were present:

Barnstable.
P. Pineo.

Berkshire.
C. W. Burton.

Bristol South.
R. T. Davis,
E. T. Learned,
A. B. Paun.

Essex North.
D. Dana,
O. S. Lovejoy,
G. W. Snow.

Essex South.
J. Allen,
A. H. Johnson,
A. Kemble,
E. Newhall,
G. A. Priest.

Hampden.
T. F. Breck,
G. E. Fuller.

Middlesex East.
S. W. Abbott,
F. F. Brown.

Middlesex North.
M. G. Parker.

Middlesex South.
B. F. D. Adams,
A. H. Blanchard,
H. C. Chapin,
T. Crozier,
R. L. Hodgdon,
H. Holmes,
L. R. Stone,
G. J. Townsend,
C. E. Vaughan,
A. C. Webber,
W. W. Wellington,
R. Willis,
M. Wyman.

Norfolk.
R. Amory,
B. Cushing,
W. S. Everett,
G. W. Fay,
J. S. Flint,
J. S. Greene,
A. R. Holmes,
S. E. Stone,
J. H. Streeter,
U. O. B. Wingate.

Plymouth.
J. B. Brewster,
J. C. Gleason.

Suffolk.
J. Ayer,

H. H. A. Beach,	W. Ingalls,	*Worcester.*
H. I. Bowditch,	S. W. Langmaid,	F. W. Brigham,
S. Cabot,	G. H. Lyman,	A. G. Blodgett,
D. W. Cheever,	F. Minot,	W. P. Bowers,
H. Curtis,	W. L. Richardson,	F. D. Brown,
F. W. Draper,	G. C. Shattuck,	G. E. Francis.
R. H. Fitz,	D. H. Storer,	
C. F. Folsom,	C. W. Swan,	*Worcester North.*
S. A. Green,	W. G. Wheeler,	G. D. Colony.
R. M. Hodges,	E. N. Whittier,	
C. D. Homans,	H. W. Williams.	Total, 72.

The record of the previous meeting was read and accepted.

On nomination by the President, the following were appointed delegates to other State Medical Societies:

Vermont.—Drs. G. C. Lawrence, of North Adams; M. Calkins, of Springfield.

New York.—Drs. J. H. Mackie, of New Bedford; J. B. Rich, of Worcester.

The Committee on Membership and Resignations reported through Dr. Ayer, and recommended that the following be allowed to retire:

Drs. John W. Brewster, of Pittsfield.
Josiah Trow, of Buckland.
William M. Bass, of Sandwich.

Also, that the following be dropped from the roll on account of removal from the State:

Drs. Herbert C. Belden, of East Granby, Conn.
George J. Bull, of Colorado Springs, Col.
Walter H. Holmes, of Waterbury, Conn.

The recommendations of the Committee were adopted.

Voted,—That the following be restored to fellowship:

Dr. Charles Abraham Burnham, of Boston.

The Joint Committee of the Society and Councillors appointed at the last meeting to report whether it is desirable to formulate a new code of By-Laws, and to consider the relative rights of the Councillors and Society to originate amendments to the By-Laws, reported through its Chairman, Dr. Hildreth.

The report stated that it is not necessary to formulate a new Code, as the last edition contains and includes all the By-Laws that are now in force.

Concerning the relative rights of the Councillors and Society to originate amendments to By-Laws, the Committee reported that as By-Law XXXIII. (the only one touching upon the subject) is not sufficiently concise, it is desirable for the Councillors and Society to amend and alter this By-Law as follows:—In all changes of the By-Laws requiring as they do a concurrent vote of the Councillors and Society, the action of the Councillors should precede that of the Society, but it shall be competent for a Fellow at any meeting of the Society to propose an alteration of any By-Laws, and the said proposition shall at once be referred to the Councillors, and in case of its adoption by the Councillors it shall be submitted again to the Society for final action, which shall be in accordance with lines 17 to 19 of By-Law XXXIII.

After discussion in which Drs. Hodgdon, Cabot, Shattuck and Bowditch participated, on motion of Dr. Wyman it was

Voted,—That the whole subject be indefinitely postponed.

Dr. Bowditch offered the following:

Resolved,—That a Committee be appointed to seek legal counsel on the following question:

"Have the Councillors of the Massachusetts Medical Society, or the Society itself, a right under its present Constitution, to examine women as to their qualifications to practise physic, and to give diplomas, signed by the proper officers and under the seal of the Society, to all capable of passing such examinations as are now made of male applicants? Provided, however, that such diplomas shall not be considered as making the successful candidates members of the Society."

Resolved,—That the Committee is hereby directed to report at the next meeting of the Councillors, what action should be taken by the Councillors and the Society on the subject.

After some discussion the resolutions were not adopted.

At 12.30, P.M., the Councillors adjourned.

FRANCIS W. GOSS,
Recording Secretary.

FEBRUARY 1, 1882.

A STATED MEETING of the Councillors was held in the Hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Wednesday, February 1, 1882, at 11 o'clock, A.M.

The President, Dr. H. W. WILLIAMS, in the Chair.

The following Councillors were present:

Barnstable.
G. N. Munsell,
P. Pineo.

Bristol North.
S. D. Presbrey.

Bristol South.
A. B. Paun.

Essex North.
D. Dana.

Essex South.
C. A. Carlton,
A. H. Johnson,
A. Kemble,
E. Newhall,
J. G. Pinkham.

Middlesex North.
W. Bass,
W. H. Leighton,
M. G. Parker.

Middlesex South.
T. Crozier
J. G. Dearborn,
H. Holmes,
H. E. Marion,
L. R. Stone,
W. W. Wellington,
R. Willis.

Norfolk.
R. Amory,
J. W. Chase,
W. S. Everett,
G. W. Fay,
J. H. Gilbert,
H. G. Morse,
J. H. Streeter,
U. O. B. Wingate,
J. A. Winkler.

Plymouth.
J. C. Gleason,
Asa Millet,
A. E. Paine.

Suffolk.
S. L. Abbot,
J. Ayer,
H. H. A. Beach,
H. I. Bowditch,
O. W. Doe,
F. W. Draper,
F. B. Greenough,
D. H. Hayden,
R. M. Hodges,
C. D. Homans,
J. Homans,
W. Ingalls,
B. J. Jeffries,
F. I. Knight,
G. H. Lyman,
G. C. Shattuck,
D. H. Storer,
A. M. Sumner,
C. W. Swan,
G. G. Tarbell,.
O. F. Wadsworth,
H. W. Williams.

Worcester.
F. D. Brown,
G. E. Francis.

Total, 56.

The record of the previous meeting was read and accepted.

On nomination by the President, the following were appointed to attend meetings of other State Medical Societies:

Maine.—Drs. S. K. Towle, of Haverhill; W. Dwight, of North Amherst.

New Hampshire.—Drs. G. B. Shattuck, of Boston; H. Gamwell, of Westfield.

Rhode Island.—Drs. J. Stedman, of Jamaica Plain; G. K. Sabine, of Brookline.

Connecticut.—Drs. C. N. Chamberlain, of Lawrence; W. M. Trow, of Easthampton.

New Jersey.—Drs. A. B. Paun, of Middleboro'; A. C. Deane, of Greenfield.

The following Committees were appointed:

To Audit the Treasurer's Accounts.—Drs. J. Homans, E. J. Forster.

To Examine the Library.—Drs. J. J. Minot, V. Y. Bowditch.

To Examine the By-Laws of District Societies.—Drs. A. Millet, S. D. Presbrey, J. C. White.

The Committee on Membership and Resignations through its Chairman, Dr. Ayer, reported favorably on the nomination made at the last meeting of Sir James Paget, of London, England, to Honorary Membership, and the same was duly elected by ballot.

The Committee also recommended and the Councillors voted that the following be permitted to resign:

Dr. Lewis W. Loring, of Boston.

Also, that the following be allowed to retire:

Drs. William J. Currier, of Lexington.
John B. King, of Nantucket.

Also, that the following be dropped from the roll on account of non-residence:

Drs. Samuel W. French, of Milwaukee, Wis.
Charles W. Parsons, of Santa-Barbara, Cal.
John B. Wheeler, of Burlington, Vt.

The Committee on Medical Diplomas, appointed in June, 1881, reported through its Chairman, Dr. Swan, and submitted a list of such American Medical Colleges as in its opinion deserved to be recognized by the Councillors for the purpose set forth in By-Law I. The report thus presented was, after some discussion, adopted.

A communication was presented from the general Censors' meeting, petitioning the Councillors to initiate such a change in the By-Laws as may make an annual meeting of delegate Censors obligatory; also to consider the question whether By-Law I. does not require revision in order that it may be accepted as a literal guide for the several Censors' Boards.

Dr. Millet moved that a Committee of three be appointed by the Chair to consider the petition and to report at the next meeting.

The motion was adopted, and Drs. S. K. Towle, A. H. Cowdrey and R. Amory were appointed to constitute the committee.

Dr. Lyman offered the following, which was adopted:

Moved,—That a Committee of five be appointed by the Chairman to take into consideration the legality and feasibility of making such changes in the Constitution of the Boards of Censorship as shall make the examinations for admission more uniform throughout the State.

The following were appointed to constitute the Committee: Drs. G. B. Shattuck, H. W. Dudley, S. E. Stone, G. C. McClean, C. N. Chamberlain.

At 12.15, P.M., the Councillors adjourned.

FRANCIS W. GOSS,
Recording Secretary.

Annual Meeting.

The Annual Meeting of the Councillors was held in the Hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Tuesday, June 13, 1882, at 7 o'clock, P.M.

The President, Dr. H. W. Williams, in the chair.

The following Councillors were present:

Barnstable.
B. D. Gifford,
P. Pineo.

Berkshire.
L. Miller.

Bristol North.
S. D. Presbrey,
J. E. Totten.

Bristol South.
S. W. Bowen,
F. H. Hooper,
G. T. Hough,
J. H. Mackie.

Essex North.
O. D. Cheney,
A. B. Dearborn,
O. Warren.

Essex South.
D. Coggin,
C. A. Carlton,
W. W. Eaton,
J. S. Emerson,
W. B. Goldsmith,
A. H. Johnson,
C. A. Lovejoy,
G. S. Osborne,
C. C. Pike.

Franklin.
J. H. Goddard,
A. C. Walker.

Hampden.
T. F. Breck,
M. Calkins,
G. C. McClean.

Hampshire.
J. Dunlap,
D. B. N. Fish,
G. F. Thomson.

Middlesex East.
F. F. Brown,
F. Winsor.

Middlesex North.
C. Dutton,
F. Nickerson,
G. E. Pinkham,
F. C. Plunkett.

Middlesex South.
B. F. D. Adams,
J. G. Dearborn,
R. L. Hodgdon,
H. Holmes,
A. Hosmer,
H. E. Marion,
A. L. Norris,
C. E. Spring,
E. H. Stevens,
L. R. Stone,
G. J. Townsend,
C. E. Vaughan,
A. C. Webber,
W. W. Wellington,
R. Willis,
M. Wyman.

Norfolk.
G. A. Bragdon,
J. S. Flint,
J. S. Greene,
C. C. Hayes,
E. Mead,
H. G. Morse,
J. Seaverns,
D. B. Van Slyck,
U. O. B. Wingate,
J. A. Winkler.

Plymouth.
J. C. Gleason,
A. E. Paine.

Suffolk.
S. L. Abbot,
J. Ayer,
H. J. Bigelow,
H. I. Bowditch,
S. Cabot,
D. W. Cheever,
O. W. Doe,
F. W. Draper,
R. H. Fitz,
C. F. Folsom,
J. O. Green,
S. A. Green,
F. B. Greenough,
W. H. H. Hastings,
D. H. Hayden,
R. M. Hodges,
C. D. Homans,

J. Homans,
W. Ingalls,
B. J. Jeffries,
G. H. Lyman,
F. Minot,
C. B. Porter,
J. P. Reynolds,
W. L. Richardson,
G. C. Shattuck,
B. S. Shaw,
A. D. Sinclair,
A. M. Sumner,
C. W. Swan,
G. G. Tarbell,
O. F. Wadsworth,
J. C. Warren,
T. Waterman,
W. G. Wheeler,
J. C. White,
E. N. Whittier,
H. W. Williams.

Worcester.

F. W. Brigham,
E. B. Harvey,
O. Martin,
J. M. Rice.

Worcester North.

R. F. Andrews,
G. D. Colony,
G. Jewett,
Ira Russell,
F. H. Thompson.

Total, 110.

The record of the previous meeting was read and accepted.

The names of the Nominating Committee, as chosen by the District Societies, were announced.

The Committee was composed as follows:

Drs. P. Pineo, ...	Barnstable.
Abner M. Smith, . .	Berkshire.
S. D. Presbrey, . . .	Bristol North.
J. H. Mackie, . . .	Bristol South.
C. G. Carleton, . . .	Essex North.
A. H. Johnson, . . .	Essex South.
J. H. Goddard, . . .	Franklin.
T. F. Breck, ...	Hampden.
D. B. N. Fish, . . .	Hampshire.
G. E. Pinkham, . .	Middlesex North.
G. J. Townsend, . . .	Middlesex South.
F. F. Brown, ...	Middlesex East.
J. S. Flint, ...	Norfolk.
A. Millet, ...	Plymouth.
G. C. Shattuck, . . .	Suffolk.
O. Martin, ...	Worcester.
I. Russell, ...	Worcester North.

The member from Plymouth District being absent, Dr. J. C. Gleason was substituted as its representative.

The Secretary read the names of new and of deceased Fellows.

The Treasurer, Dr. Draper, read his annual report.

The Auditing Committee reported that they found the accounts properly vouched and correctly cast; also that they

examined the evidences of the Society's funded property, and found the same safely kept.

The Treasurer's report was accepted.

The Committee on Finances reported through Dr. Homans, and recommended that the whole surplus, $710.05, in the Society's treasury be divided among the several District Societies.—Adopted.

The Committee on Membership and Resignations reported through Dr. Ayer. In accordance with their recommendation the following were allowed to resign:

Drs. Henry Tuck, of New York, N. Y.
John W. Brannan, of Colorado.
Joseph W. Clift, of Washington, D. C.

Also, the following were allowed to retire:

Drs. Nathan French, of Malden.
John Hooker, of Springfield.
Levi Pillsbury, of Fitchburg.
Thomas Womersley, of Greenfield.
Joseph D. Mansfield, of Wakefield.
Aaron Young, of Boston.

Also, the following was restored to Fellowship:

Dr. Adoniram Judson Gray, of Cheyenne, Wyoming.

The Committee on Publications reported through Dr. Shattuck.

The Librarian, Dr. Hayden, made his annual report.

The Committee to whom was referred the petition from the General Censors' meeting reported regarding the request that the Councillors initiate such a change in the By-Laws as may make an annual meeting of delegate Censors obligatory, that it does not appear that the Censors can be legally required to meet for any other purpose than to examine candidates for admission to the Society, but they suggested that the Censors for the Suffolk District be requested to invite the Censors for the other District Societies to meet with them annually for conference.

Regarding the prayer that the Councillors consider whether

By-Law I. does not require revision in order that it may be accepted as a literal guide for the several Censors' Boards, the Committee reported that the proposal seems hardly possible, or even desirable. Each Board must exercise discretion in the examination of each candidate, and absolute uniformity of requirements would be very far from good policy or justice. A certain amount of elasticity seems for the best interests of the Society—which needs all honorable physicians in its ranks with their diversified gifts and attainments—and as the Censors now have full discretion in the matter, and can well judge what is needed in each locality and case, it appears safe to allow the present By-Law to remain unchanged. A question might also arise as to the legal effect of striking out any portion of the requirements for admission as recited in the original organization.

The report of the Committee was accepted, and its recommendations were adopted.

The Committee appointed to consider the legality and feasibility of making such changes in the constitution of the Boards of Censorship as shall make the examinations for admission more uniform throughout the State, reported through its chairman, Dr. Shattuck. The report discussed various changes which it is legal and possible to make in the constitution of the Boards, so as to secure greater uniformity in examinations, but the question arose whether in making such changes some advantages of the present system might not be lost. The report closed with the recommendation that the question be referred to a Committee, charged with reporting on the whole subject of admission to the Society, and suggesting such modifications of the present system as may be necessary.

Voted,—That the report be accepted and its recommendations be adopted.

Voted,—That the same Committee be appointed to carry out the recommendations of the report.

The Committee on Nominations, through Dr. Shattuck, reported a list of candidates for the offices of the Society, and the same were elected by ballot:

President . .	Dr. ALFRED HOSMER, of Watertown.
Vice-President . .	Dr. JOHN H. MACKIE, of New Bedford.
Treasurer . .	Dr. FRANK W. DRAPER, of Boston.
Corresponding Secretary	Dr. CHARLES W. SWAN, of Boston.
Recording Secretary .	Dr. FRANCIS W. GOSS, of Roxbury.
Librarian . .	Dr. DAVID H. HAYDEN, of Boston.

Dr. AMOS H. JOHNSON, of Salem, was chosen Orator, and

Dr. FRANCIS H. BROWN, of Boston, Anniversary Chairman, for the next Annual Meeting.

Voted,—That the next Annual Meeting be held in Boston, on the second Wednesday in June, 1883.

On nomination by the President the following Standing Committees were appointed:

Of Arrangements.

F. C. Shattuck, E. H. Bradford, A. T. Cabot,
E. G. Cutler, C. E. Wing, H. C. Haven.

On Publications.

G. C. Shattuck, R. M. Hodges, B. E. Cotting.

On Membership and Resignations.

J. Ayer, F. Minot, D. W. Cheever.

On Finances.

C. D. Homans, W. W. Wellington, B. S. Shaw.

To Procure Scientific Papers.

C. W. Swan, F. K. Paddock, G. S. Stebbins,
J. R. Chadwick, R. H. Fitz.

On Ethics and Discipline.

G. J. Townsend, G. E. Francis, A. H. Johnson,
C. Howe, W. L. Richardson.

On Medical Diplomas.

J. Collins Warren, A. H. Cowdrey, E. J. Forster.

In accordance with instructions the Secretary read the vote passed by the Society at the adjourned meeting held

during the afternoon—"that in the opinion of the members here present it is expedient that well qualified women be admitted to fellowship on the same terms as men."

After some remarks by Drs. Shattuck and Wyman, Dr. Harvey, of Westboro', moved that the further consideration of the subject be indefinitely postponed.

Carried—65 in the affirmative, 36 in the negative.

Dr. Winsor offered the following amendment to the By-Laws:

Insert in By-Law XXXIII., after the word "Society" in the second line of the second paragraph, the words: "Either body having the power to initiate action looking to such alteration."

The amendment was not adopted, 45 in the affirmative, 46 in the negative.

The appeal for a new trial in behalf of Dr. F. F. Moore, who had been sentenced to expulsion by a Board of Trial, was unanimously refused.

The President gave a cordial invitation to the Councillors to the hospitalities of his house on the adjournment of the meeting.

The President introduced the President-elect, Dr. Alfred Hosmer, who made a brief response.

At 9.15, P.M., the Councillors adjourned.

FRANCIS W. GOSS,
Recording Secretary.

Massachusetts Medical Society.

PROCEEDINGS OF THE SOCIETY.

ADJOURNED MEETING.

JUNE 13, 1882.

THE SOCIETY met pursuant to adjournment at 4 o'clock, P.M., June 13, 1882, in Horticultural Hall, Boston.

The President, Dr. H. W. WILLIAMS, in the Chair.

The Secretary read the portion of the record of the last Annual Meeting pertaining to this Adjourned Meeting.

Dr. Hodgdon offered the following:

Voted,—That the first four lines of the first By-Law be stricken out, and the following clause inserted in their place: "Candidates for admission into the Massachusetts Medical Society may be male or female, and every candidate must, by proper credentials and examination, satisfy the Censors of said Society that he possesses the following qualifications for fellowship:—"

The President ruled that this motion might be discussed by the Society, but could not be acted upon until it had first been referred to the Councillors, and passed by that body.

Dr. Hodgdon appealed from the decision of the Chair. The question being put on affirming the ruling of the Chair, it was sustained by a vote of 131 in the affirmative, to 125 in the negative.

Dr. Harvey moved that the original motion be referred to the Councillors. Dr. Hodgdon moved to add, "with the recommendation that they take favorable action."

A prolonged discussion ensued, during which Dr. Winsor offered the following, as a substitute for Dr. Hodgdon's original motion.

Voted,—That in the opinion of the members here present it is expedient that well qualified women be admitted to fellowship on the same terms as men, and that the Secretary be instructed to lay this vote before the Council to-night.

Dr. Winsor's motion was adopted, 104 in the affirmative to 60 in the negative.

Adjourned at 6, P.M.

FRANCIS W. GOSS,
Recording Secretary.

ANNUAL MEETING.

FIRST DAY.

The Society met in Horticultural Hall, Boston, on Tuesday, June 13, 1882, at 12 o'clock, M.

The President, Dr. H. W. WILLIAMS, in the Chair.

The reading of papers was begun as follows:

1. COTTAGE HOSPITALS.—By Lucius W. Baker, M.D., of Baldwinville.

After the reading of the paper a discussion ensued, in which Drs. Knowlton, Cornell, and Hooper took part.

2. DISEASE GERMS.—By James W. Hannum, M.D., of Ludlow.
3. THE COINCIDENCE OF ANAL FISTULA AND PHTHISIS.—By Walter Ela, M.D., of Cambridge.

Dr. H. Osgood made some remarks regarding this paper.

4. OBSCURE MENTAL SYMPTOMS OF DISEASE.—By Charles F. Folsom, M.D., of Boston.

This paper was discussed by Drs. Bowditch, Channing, Hazelton, and J. B. Lyman.

Adjourned at 2 o'clock, P.M.

FRANCIS W. GOSS,
Recording Secretary.

Second Day.

The Society met in Horticultural Hall, Boston, on Wednesday, June 14, 1882, at 9 o'clock, A.M., for the Anniversary Exercises.

The President, Dr. H. W. Williams, in the Chair.

The records of the last Annual Meeting and of the Adjourned Meeting were read and accepted.

The sentences of Boards of Trial in the following cases were confirmed, and it was voted that the following Fellows be and are expelled from their membership of the Massachusetts Medical Society:

Frederick F. Moore, M.D., of New York, N. Y.
Rufus K. Noyes, M.D., of Lynn.

The Secretary read the names of Fellows admitted since the last Annual Meeting, and of Fellows whose deaths had been reported.

Fellows admitted since June 7, 1881.

1881	Aldrich, Eben True	Lowell.
1881	Atwood, Frank Sumner	Salem.
1882	Averhill, Jesse Howes	Campello.
1881	Bailey, Charles Hardy	South Gardner.
1882	Baker, Harry Beecher	Dighton.
1882	Blaisdell, George Warren	Manchester.
1881	Bowditch, Vincent Yardley	Boston.
1882	Brinley, William Henry	Colerain.
1881	Brown, Sanger	Danvers.
1881	Browne, William Tyler	Boston.
1882	Buck, Howard Mendenhall	Boston.

1881	Bugbee, La Fayette . . .	South Boston.
1881	Call, Charles Henry . . .	Vermillion, Dacota.
1881	Chagnon, Wincelas Jean Baptiste	Fall River.
1881	Church, Moses Davis . .	Cambridgeport.
1881	Coe, Henry Clarke . . .	New York, N. Y.
1881	Colt, Henry, Jr. . . .	Pittsfield.
1882	Crawford, Charles Henry . .	Lawrence.
1881	Crittenden, Ralph Asaph . .	Haverhill.
1882	Curran, Charles James . .	North Adams.
1882	Cushman, George Thomas .	Boston.
1882	Cushman, William Baxter .	Oxford.
1882	Denny, Charles Frederick .	Boston.
1882	Des Jardins, Guillaume Henri .	Boston.
1881	Dewey, Henry Wells, Jr. . .	Pittsfield.
1881	Doble, Ernest Edgar . .	Boston.
1882	Doggett, Frederick Forbes .	South Boston.
1882	Dow, George William . .	Lawrence.
1882	Drew, Frank Haynes . .	Greenfield.
1881	Durgin, Frank Albert . .	Salem.
1882	Dyer, Ebenezer Alden . .	Northampton.
1881	Ernst, Harold Clarence . .	Jamaica Plain.
1882	Flood, Everett	Worcester.
1882	Galligan, Edward Francis .	Taunton.
1882	Garceau, Alexander Emmanuel .	Hyde Park.
1882	Gerould, Joseph Bowditch .	North Attleboro'.
1882	Godding, Clarence Miles . .	Boston.
1882	Golden, Michael Charles . .	Taunton.
1881	Goldsmith, William Benjamin .	Danvers.
1881	Goodell, George Zina . .	Salem.
1882	Gorton, William Arthur . .	Danvers.
1882	Grainger, William Henry . .	East Boston.
1882	Granger, Frank Clark . .	Randolph.
1882	Gould, Charles Asahel . .	Adamsville, R. I.
1881	Hall, Josiah Newhall . .	Boston.
1882	Haynes, Charles Frederick .	West Newton.
1882	Hewins, Parke Woodbury .	Boston.
1882	Houston, John Alexander . .	Worcester.
1882	Howard, Amasa . . .	Chelmsford.
1881	Hubbard, Josiah Clark . .	Holyoke.
1881	Knapp, Philip Coombs, Jr. .	Boston.
1881	Knowles, Rollin Henry . .	Becket.
1881	Leonard, Henry Fiske . .	Boston.
1881	Liebmann, Gustave . . .	Boston.
1882	Lombard, Frederick Howard .	Boston.
1882	Lyman, Jabez Baldwin . .	Salem.
1881	Lyons, Herbert Henry . .	Fitchburg.
1882	Mackie, George . . .	Attleboro'.

1882	Magee, Anthony Bernard . .	Lawrence.
1882	Mayberry, Edwin . . .	Weston.
1882	McIntire, Herbert Bruce . .	Cambridge.
1881	McMichael, Willis Brooks .	East Boston.
1881	Mixter, Samuel Jason . .	Boston.
1882	Morse, George Mason . .	Clinton.
1881	Nelson, Samuel Newell . .	Cambridgeport.
1882	Newell, Otis Kimball . .	Boston.
1881	Noyes, Ernest Henry . .	Boston.
1882	Palmer, Lewis Merritt . .	South Framingham.
1881	Perkins, Henry Phelps . .	Lowell.
1881	Prior, Charles Edwin . .	Melrose.
1882	Quimby, Sumner Ferdinand .	Gloucester.
1882	Ricker, Charles Henry . .	Lowell.
1882	Ricker, Clinton Josiah . .	Chatham.
1881	Robbins, James Watson . .	New Marlboro'.
1882	Sanford, Isaac Reed . . .	Sheffield.
1882	Scribner, Ernest Varion . .	Worcester.
1881	Shanahan, John . . .	Peabody.
1882	Sherman, Frank Morton . .	Dartmouth.
1882	Smith, George Carroll . .	South Natick.
1882	Snow, Asa Vernon . . .	Cooleyville.
1881	Steere, David Roscoe . .	Groton.
1881	Sturgis, Russell, 3d . . .	Boston.
1882	Taylor, Frederic Weston . .	East Cambridge.
1882	Thayer, George Dickinson .	Northampton.
1882	Thurlow, John Howard . .	Roxbury.
1882	Tilton, Josiah Odin . . .	North Cambridge.
1882	Twitchell, George Pierce . .	Boston.
1882	Vickery, Herman Frank . .	Boston.
1882	Warren, Joseph Whitehead .	Boston.
1882	West, George Webb . . .	Boston.
1882	Wetherbee, Roswell . . .	Cambridgeport.
1881	White, Andrew Marion William	Fall River.
1882	White, Herbert Warren . .	Roxbury.
1882	Whitney, Edward Melville .	Fairhaven.
1882	Whitney, Frederick Waldo .	Chelsea.
1882	Williams, Joseph . . .	Charlestown.
1882	Wood, Henry Austin . .	Boston.
1881	Woodruff, Morgan Lewis . .	Pittsfield.
1882	Woods, Jonathan Henry . .	Barre.
1882	Woodward, Lemuel Fox . .	Boston.
1881	Wooldridge, Charles William .	Ionia, Mich.
1882	Young, John Francis . .	South Boston.

Total, 102.

Also, the following, elected to Honorary Membership:

1882 Paget, James . . . . London, England.

List of Deceased Fellows.

Admitted.	Name.	Residence.	Date of Death.	Age.
1841	Bacon, John	Boston	Nov. 28, 1881	64
1875	Blair, Harvey Lester	Becket	Apr. 25, 1881	29
1872	Buttrick, Abner Wheeler	Lowell	Mar. 27, 1882	39
1848	Chace, John Bowers	Taunton	July 31, 1881	65
1874	Curtis, Thos. Buckminster	Boston	Dec. 11, 1881	39
1873	Foley, James Purcell	Fitchburg	Sept. 18, 1881	41
1832	Harwood, Daniel	Dorchester	Oct. 2, 1881	80
1873	Herrick, Albert Shaw	Lowell	June 5, 1882	38
1845	Johnson, Othello Otis	Framingham	Jan. 8, 1882	64
1846	Kelley, Elbridge Gerry	London, England	Sept. 13, 1881	68
1879	Kelly, William Philip	Boston	Apr. 9, 1882	26
1846	Kimball, Walter Henry	Andover	Sept. 30, 1881	61
1831	Leonard, Jonathan	Sandwich	Jan. 29, 1882	78
1844	Mason, Augustus	Brighton	May 24, 1882	56
1859	Marrisal, Felix V.	Fall River	Sept. 15, 1881	57
1877	McCarthy, Michael	East Boston	Oct. 30, 1881	38
1839	Miller, Erasmus Darwin	Dorchester	July 5, 1881	68
1870	Morison, James	Quincy	May 20, 1882	63
1852	Pattee, William Sewell	Quincy	Sept. 19, 1881	57
1837	Phelps, Ebenezer Smith	Middleton	May 28, 1882	90
1837	Phillips, Henry Paddleford	North Adams	Nov. 24, 1881	74
1875	Reardon, Jeremiah John	Natick	Jan. 22, 1882	32
1823	Reynolds, Edward	Boston	Dec. 25, 1881	88
1870	Shurtleff, Herbert	Campello	Mar. 31, 1882	35
1866	Smith, Isaac, Jr.	Fall River	Jan. 20, 1882	40
1846	Stacy, Horace	Boston	May 5, 1882	68
1836	Stearns, George	Groton	Mar. 7, 1882	79
1881	Thomas, John Glover	Worcester	Nov. 29, 1881	35
1838	Tucker, Joshua	Boston	Nov. 7, 1881	81
1861	*Valerj, Gaetano	Rome, Italy	Feb. 12, 1881	64
1841	Wheeler, Edw. Marshall	Spencer	Nov. 13, 1881	70
1852	Whitney, Allston Waldo	West Newton	Nov. 11, 1881	52
1860	*Wood, James Rushmore	New York, N. Y.	May 4, 1882	70

* Honorary. Total, 33.

Dr. Jeffries offered the following, which was adopted:

Whereas, In response to the petition to Congress, the Committee on Naval Affairs has reported a joint resolution authorizing the President to initiate an international commission in reference to color-blindness and visual acuteness in navies and merchant marines;

Resolved,—That the Massachusetts Medical Society would hereby call the attention of the Massachusetts Senators and Representatives in Congress to the great importance of this bill, and the necessity of passing it during the present session.

Resolved,—That the Secretary of the Society is hereby directed

to transmit a copy of this vote to each of the honorable Senators and Representatives from Massachusetts.

Papers were read as follows:

5. American Dyspepsia.—By James H. Robbins, M.D., of Hingham.

In the discussion which followed, Drs. Cornell, Weeks, and Millet took part.

6. A Study of the Action of Iron.—By Francis H. Williams, M.D., of Boston.

This paper was discussed by Drs. Monroe and Batchelder.

7. Relation of Mould Fungi to Disease.—By William W. Gannett, M.D., of Boston.

The following delegates from other Medical Societies were introduced by the President:

Maine.—Dr. J. O. Webster.
New Hampshire.—Drs. D. S. Adams, W. B. Porter, T. J. W. Pray, J. Wheeler.
Rhode Island.—Dr. W. O. Brown.
Connecticut.—Dr. W. H. Carmalt.
New York.—Dr. G. G. Monroe.
New Jersey.—Dr. A. C. Hunt.
Ontario.—Dr. N. A. Powell.

Drs. Porter, Brown, Monroe, Hunt and Powell offered the salutations of their respective societies.

At 12 o'clock the Annual Discourse was delivered by Dr. James P. Lynde, of Athol.

In introducing the orator, the President stated that Dr. Earle, who was appointed a year ago to deliver the discourse, was obliged late in the year to decline the duty on account of ill health, and Dr. Lynde had consented to become his substitute.

At the close of the oration the Society presented a vote of thanks to the orator for his able, interesting, and scientific address.

The President introduced the President elect, Dr. ALFRED HOSMER, of Watertown, who made a brief response.

At 1.15, P.M., the Society adjourned to the Music Hall, where dinner was served to more than seven hundred Fellows.

FRANCIS W. GOSS,
Recording Secretary.

TREASURER'S REPORT.

The Treasurer respectfully reports that he received for the Society during the year ending April 15, 1882, the sum of $9,192.49, and that he expended $8,482.44, as is more fully set forth in the accompanying analysis account. Although the receipts were somewhat larger than the recent annual average, the extraordinary expenses incidental to the celebration of the Society's Centennial Anniversary have reduced the balance remaining in the Treasury at the end of the year to less than half of that of the year previous. There is good reason to anticipate, however, that during the current year the Society's finances will fully recover their recent prosperity.

Through the generous favor of its founder, the Cotting Fund has been doubled within the past year, and the income of $2000.00 is now available, in accordance with the wishes of the donor, for the providing of "simple refreshments" for the Councillors at their Stated Meetings.

In other respects, the invested funds of the Society remain without change.

F. W. DRAPER,

Boston, June 10, 1882. *Treasurer.*

Boston, May 5, 1882.

The undersigned, a Committee appointed to audit the accounts of the Treasurer of the Mass. Med. Society, for the financial year ending April 15, 1882, respectfully report that they have attended to the duty assigned them; they find the accounts properly vouched and correctly cast. They report also that they have examined the evidences of the Society's funded property, and find the same safely kept.

JOHN HOMANS, } *Auditing*
EDWARD J. FORSTER, } *Committee.*

DR. F. W. Draper, Treasurer, in Account with

INCOME.

Balance from last account		$1543 24
Assessments paid to the Treasurer		1795 00
Assessments collected by DISTRICT TREASURERS:—		
Barnstable	$115 00	
Berkshire	70 00	
Bristol North	120 00	
Bristol South	155 00	
Essex North	225 00	
Essex South	265 00	
Franklin	75 00	
Hampden	225 00	
Hampshire	155 00	
Middlesex East	95 00	
Middlesex North	295 00	
Middlesex South	245 00	
Norfolk	275 00	
Plymouth	135 00	
Suffolk	1465 00	
Worcester	430 00	
Worcester North	175 00	
		4520 00
Interest account:—		
General Fund	450 12	
Shattuck Fund	366 67	
Phillips Fund	400 00	
Cotting Fund	40 00	
Interest on deposit account, New England Trust Co.	24 14	
		1280 93
Diplomas		25 00
Sale of Publications		4 50
Surplus of Subscription Fund, Centennial Anniversary . .		23 82
. . . .		$9192 49

the Massachusetts Medical Society. Cr.

Expense.

On account of the Annual Meeting, 1881:—			
	Caterer's bill	$1443 75	
	Cigars	81 00	
	The Exhibition	249 95	
	Horticultural Hall	200 00	
	Incidentals	34 96	
	Music	20 00	
	Music Hall	204 00	
	Printing	41 05	
			$2274 71
Ethics and Discipline:—			
	Mileage of Committee	35 00	
	Expenses of Board of Trial	39 20	
			74 20
Committee on Publications:—			
	Braithwaite's Retrospect	1997 50	
	Printing annual Publications	612 16	
			2609 66
Councillors' Orders:—			
	Lunches at Stated Meetings	60 00	
	Attorney's fees	2 50	
	Printing Triennial Catalogue	322 13	
			384 63
On District Societies' Account:—			
	Advertising Censors' meetings	3 00	
	Censors' fees	153 00	
	Dividend, 1881	1388 92	
	Lunch for Censors' Convention	41 75	
	Treasurer's fees	255 32	
			1841 99
Librarian's Expenses:—			
	Postage	298 71	
	Printing	4 75	
	Stationery	2 00	
			305 46
Recording Secretary's Expenses:—			
	Incidentals	4 00	
	Postage	60 40	
	Printing	39 89	
	Salary	250 00	
	Stationery	5 93	
			360 22
Rent			150 00
Treasurer's Expenses:—			
	Incidentals	16 00	
	Postage	27 20	
	Printing	21 62	
	Salary	400 00	
	Stationery	16 75	
			481 57
			8482 44
Balance to new account			710 05
			$9192 49

Officers of the Massachusetts Medical Society.
1882–83.

Chosen June 13, 1882.

ALFRED HOSMER,	. Watertown,	. President.
JOHN H. MACKIE, .	. New Bedford,	. Vice President.
FRANK W. DRAPER,	. Boston, .	. Treasurer.
CHARLES W. SWAN,	. Boston, .	. Cor. Secretary.
FRANCIS W. GOSS,	. Roxbury,	. Rec. Secretary.
DAVID H. HAYDEN,	. Boston, .	. Librarian.
AMOS H. JOHNSON,	. Salem, .	. Orator.
FRANCIS H. BROWN,	. Boston, .	. Anniv. Chairman.

Standing Committees.

Of Arrangements.

F. C. Shattuck, C. E. Wing,
E. G. Cutler, A. T. Cabot,
E. H. Bradford, H. C. Haven.

On Publications.

G. C. Shattuck, R. M. Hodges, B. E. Cotting.

On Membership and Resignations.

J. Ayer, F. Minot, D. W. Cheever.

On Finances.

C. D. Homans, W. W. Wellington, B. S. Shaw.

To Procure Scientific Papers.

C. W. Swan, F. K. Paddock, G. S. Stebbins,
J. R. Chadwick, R. H. Fitz.

On Ethics and Discipline.

G. J. Townsend, G. E. Francis, A. H. Johnson,
C. Howe, W. L. Richardson.

On Medical Diplomas.

J. C. Warren, A. H. Cowdrey, E. J. Forster.

Presidents of District Societies—Vice-Presidents (Ex-Officiis).

[Arranged according to Seniority.]

J. L. Sullivan,
C. N. Chamberlain,
R. M. Hodges,
J. P. Lynde,
H. M. Holmes,
N. M. Ransom,
A. H. Cowdrey,
J. H. Goddard,
B. F. Hastings,
C. Dutton,
E. B. Harvey,
J. B. Whitaker,
J. G. Pinkham,
W. N. Stone,
J. B. Learned,
S. W. Bowles.

Councillors.

Barnstable.—Drs. T. R. Clement, Centreville; B. D. Gifford, Chatham; S. H. Gould, Brewster; P. Pineo, Hyannis.

Berkshire.—Drs. O. J. Brown, C. W. Burton, North Adams; C. E. Heath, Lee; H. J. Millard, North Adams; L. Miller, Stockbridge; A. M. Smith, Pittsfield.

Bristol North.—Drs. J. Murphy, N. Paige, S. D. Presbrey, Taunton; J. E. Totten, Attleboro'.

Bristol South.—Drs. E. P. Abbé, New Bedford; G. Atwood, Fairhaven; S. W. Bowen, Fall River; F. H. Hooper, G. T. Hough, J. H. Mackie, *Vice-President*, New Bedford.

Essex North.—Drs. C. G. Carleton, Lawrence; O. D. Cheney, Haverhill; H. J. Cushing, Merrimac; A. B. Dearborn, Newburyport; O. H. Johnson, Haverhill; M. Roberts, C. C. Talbot, Lawrence; O. Warren, West Newbury.

Essex South.—Drs. C. A. Carlton, D. Coggin, Salem; W. W. Eaton, Danvers; J. S. Emerson, Lynn; W. B. Goldsmith, Danvers; J. W. Goodell, Lynn; A. H. Johnson, Salem; C. A. Lovejoy, Lynn; G. S. Osborne, C. C. Pike, Peabody; G. A. Priest, Manchester; A. N. Tupper, Rockport.

Franklin.—Drs. J. H. Goddard, Orange; C. G. Trow, Sunderland; A. C. Walker, Greenfield.

Hampden.—Drs. T. F. Breck, L. S. Brooks, M. Calkins, Springfield; F. F. Dole, Chicopee; G. C. McClean, Springfield; D. H. Nutting, Chicopee Falls.

Hampshire.—Drs. J. Dunlap, Northampton, D. B. N. Fish, Amherst; S. A. Fisk, D. Thompson, Northampton; G. F. Thomson, Belchertown.

Middlesex East.—Drs. F. F. Brown, Reading; J. M. Harlow, Woburn; F. Winsor, Winchester.

Middlesex North.—Drs. C. Dutton, Tyngsboro'; C. M. Fisk, Lowell; S. W. Fletcher, Pepperell; L. S. Fox, F. Nickerson, M. G. Parker, G. E. Pinkham, F. C. Plunkett, H. J. Smith, Lowell.

Middlesex South.—Drs. B. F. D. Adams, Waltham; H. Cowles, Saxonville; T. Crozier, J. G. Dearborn, Charlestown; E. W. Emerson, Concord; R. L. Hodgdon, Arlington; H. Holmes, Lexington; A. Hosmer, *President*, Watertown; O. E. Hunt, Newtonville; H. E. Marion, Brighton; A. L. Norris, Cambridgeport; C. E. Spring, Holliston; E. H. Stevens, North Cambridge; L. R. Stone, Newton; G. J. Townsend, So. Natick; C. E. Vaughan, Cambridge; A. C. Webber, W. W. Wellington, Cambridgeport; R. Willis, Somerville; M. Wyman, Cambridge.

Norfolk.—Drs. R. Amory, Brookline; H. P. Bowditch, Jamaica Plain; G. A. Bragdon, B. Cushing, Dorchester; J. S. Flint, Roxbury; J. S. Greene, Dorchester; C. C. Hayes, Hyde Park; E. Mead, H. G. Morse, Roxbury; G. P. Pratt, Cohasset; J. Seaverns, Roxbury; D. B. Van Slyck, Brookline; U. O. B. Wingate, Wellesley; J. A. Winkler, Jamaica Plain.

Plymouth.—Drs. J. B. Brewster, Plymouth; N. P. Brownell, South Scituate; J. C. Gleason, Rockland; A. Millet, East Bridgewater; A. E. Paine, Brockton.

Suffolk.—Drs. S. L. Abbot, J. Ayer, H. H. A. Beach, H. J. Bigelow, C. J. Blake, J. G. Blake, H. I. Bowditch, S. Cabot, D. W. Cheever, H. Curtis, H. Derby, O. W. Doe, F. W. Draper, *Treasurer*, T. Dwight, C. Ellis, R. H. Fitz, C. F. Folsom, J. O. Green, S. A. Green, F. B. Greenough, W. H. H. Hastings, D. H. Hayden, *Librarian*, R. M. Hodges, C. D. Homans, J. Homans, W. Ingalls, B. J. Jeffries, F. I. Knight, S. W. Langmaid, G. H. Lyman, F. Minot, C. B. Porter, J. P. Reynolds, W. L. Richardson, G. C. Shattuck, B. S. Shaw, A. D. Sinclair, D. H. Storer, A. M. Sumner, C. W. Swan, *Corresponding Secretary*, G. G. Tarbell, O. F. Wadsworth, J. C. Warren, T. Waterman, Boston; W. G. Wheeler, Chelsea; J. C. White, E. N. Whittier, H. W. Williams, Boston.

WORCESTER.—Drs. F. W. Brigham, Shrewsbury; A. G. Blodgett, West Brookfield; W. P. Bowers. Clinton; F. D. Brown, Webster; G. E. Francis, T. H. Gage, Worcester; E. B. Harvey, Westboro'; F. Kendrick, Saundersville; O. Martin, J. G. Park, Worcester; W. M. Parker, Milford; J. M. Rice, L. Wheeler, Worcester.

WORCESTER NORTH.—Drs. R. F. Andrews, Gardner; G. D. Colony, G. Jewett, Fitchburg; I. Russell, Winchendon; F. H. Thompson, Fitchburg.

Censors.

BARNSTABLE.—Drs. J. M. Crocker, Provincetown; S. T. Davis, Orleans; B. D. Gifford, Chatham; S. F. Haskins, Yarmouthport; F. W. Pierce, Marston's Mills.

BERKSHIRE.—Drs. A. N. Allen, Pittsfield; W. W. Leavitt, West Stockbridge; F. K. Paddock, Pittsfield; S. M. Reynolds, Richmond; A. M. Smith, Williamstown.

BRISTOL NORTH.—Drs. E. J. Bassett, C. Howe, W. S. Robinson, Taunton; J. E. Totten, Attleboro'; A. W. Wilmarth, Taunton.

BRISTOL SOUTH.—Drs. R. T. Davis, J. Dwelly, Fall River; S. W. Hayes, A. M. Pierce, W. H. Taylor, New Bedford.

ESSEX NORTH.—Drs. J. Crowell, Haverhill; F. B. Flanders, Lawrence; C. D. Hunkling, Haverhill; R. C. Huse, Georgetown; J. F. Young, Newburyport.

ESSEX SOUTH.—Drs. W. B. Bancroft, Beverly;, R. F. Dearborn, Lynn; T. Kittredge, Salem; C. C. Pike, Peabody; A. M. Tupper, Rockport.

FRANKLIN.—Drs. A. V. Bowker, Miller's Falls; E. A. Deane, Montague; C. E. Severance, Shelburne Falls; T. Womersley, Greenfield; W. M. Wright, Orange.

HAMPDEN.—Drs. M. Calkins, F. W. Chapin, D. Clark, Springfield; A. F. Reed, Holyoke.

HAMPSHIRE.—Drs. C. M. Barton, Hatfield; O. F. Bigelow, Amherst; F. Bonney, Hadley; D. Pickard, C. Seymour, Northampton.

MIDDLESEX EAST.—Drs. W. S. Brown, Stoneham; J. P. Elliott, North Woburn; S. W. Kelley, Woburn; D. March, Jr., Winchester; W. F. Stevens, Stoneham.

MIDDLESEX NORTH.—Drs. F. W. Chadbourne, J. J. Colton, L. Huntress, J. C. Irish, T. P. Shaw, Lowell.

MIDDLESEX SOUTH.—Drs. W. A. Bell, Somerville; C. H. Cook, Natick; E. R. Cutler, Waltham; M. A. Morris, Charlestown; J. T. G. Nichols, Cambridge.

NORFOLK.—Drs. W. H. Campbell, G. W. Clement, E. L. Farr, Roxbury; G. K. Sabine, Brookline; E. T. Williams, Roxbury.

PLYMOUTH.—Drs. H. F. Borden, E. A. Chase, Brockton; H. W. Dudley, Abington; B. Hubbard, Plymouth; J. W. Spooner, Hingham.

SUFFOLK.—Drs. A. N. Blodgett, W. H. Boardman, E. G. Cutler, T. M. Rotch, F. C. Shattuck, Boston.

WORCESTER.—Drs. W. Davis, J. B. Rich, Worcester; G. C. Webber, Millbury; J. Wilmarth, Upton; W. H. Workman, Worcester.

WORCESTER NORTH.—Drs. B. H. Hartwell, Ayer; A. O. Hitchcock, E. P. Miller, Fitchburg; J. M. Randall, Leominster; A. L. Stickney, Ashburnham.

Commissioners of Trials.

BARNSTABLE	S. Pitcher	Hyannis.
BERKSHIRE	Abner M. Smith	Pittsfield.
BRISTOL NORTH	N. Paige	Taunton.
BRISTOL SOUTH	E. T. Learned	Fall River.
ESSEX NORTH	S. K. Towle	Haverhill.
ESSEX SOUTH	E. Newhall	Lynn.
FRANKLIN	N. G. Trow	Sunderland.
HAMPDEN	J. H. Waterman	Westfield.
HAMPSHIRE	E. B. Nims	Northampton.
MIDDLESEX EAST	J. S. Clark	Melrose.
MIDDLESEX NORTH	N. Allen	Lowell.
MIDDLESEX SOUTH	E. J. Forster	Charlestown.
NORFOLK	J. Stedman	Jamaica Plain.
PLYMOUTH	W. Peirce	Plymouth.
SUFFOLK	C. W. Swan	Boston.
WORCESTER	J. S. Ames	Holden.
WORCESTER NORTH	G. D. Colony	Fitchburg.

Officers of the District Medical Societies.

Barnstable.—Dr. W. N. Stone, Wellfleet, *President;* Dr. J. E. Pratt, Sandwich, *Vice-President;* Dr. S. F. Haskins, Yarmouthport, *Secretary;* Dr. C. M. Hulbert, South Dennis, *Treasurer.*

Berkshire.—Dr. H. M. Holmes, Adams, *President;* Dr. J. F. A. Adams, Pittsfield, *Vice-President;* Dr. H. Colt, Jr., Pittsfield, *Secretary;* Dr. W. M. Mercer, Pittsfield, *Treasurer;* Dr. W. E. Vermilye, Pittsfield, *Librarian.*

Bristol North.—Dr. N. M. Ransom, Taunton, *President;* Dr. J. P. Brown, Taunton, *Vice-President;* Dr. E. F. Galligan, Taunton, *Secretary;* Dr. C. Howe, Taunton, *Treasurer;* Dr. J. B. Gerould, North Attleboro', *Librarian.*

Bristol South.—Dr. J. B. Whitaker, Fall River, *President;* Dr. F. A. Sawyer, Wareham, *Vice-President;* Dr. A. M. Pierce, New Bedford, *Secretary, Treasurer and Librarian.*

Essex North.—Dr. C. N. Chamberlain, Lawrence, *President;* Dr. S. K. Towle, Haverhill, *Vice-President;* Dr. G. W. Snow, Newburyport, *Secretary and Treasurer.*

Essex South.—Dr. J. G. Pinkham, Lynn, *President;* Dr. A. Kemble, Salem, *Vice-President;* Dr. T. Kittredge, Salem, *Secretary;* Dr. D. Coggin, Salem, *Treasurer;* Dr. G. Z. Goodell, Salem, *Librarian.*

Franklin.—Dr. J. H. Goddard, Orange, *President;* Dr. E. C. Coy, Turner's Falls, *Vice-President;* Dr. A. C. Deane, Greenfield, *Secretary, Treasurer and Librarian.*

Hampden.—Dr. S. W. Bowles, Springfield, *President;* Dr. G. S. Stebbins, Springfield, *Vice-President;* Dr. G. C. McClean, Springfield, *Secretary, Treasurer and Librarian.*

Hampshire.—Dr. J. B. Learned, Florence, *President;* Dr. C. M. Barton, Hatfield, *Vice-President;* Dr. C. W. Cooper, Northampton, *Secretary;* Dr. J. Dunlap, Northampton, *Treasurer;* Dr. C. Seymour, Northampton, *Librarian.*

Middlesex East.—Dr. A. H. Cowdrey, Stoneham, *President;* Dr. A. Ames, Wakefield, *Vice-President;* Dr. G. E. Putney, Reading, *Secretary;* Dr. J. O. Dow, Reading, *Treasurer and Librarian.*

MIDDLESEX NORTH.—Dr. C. Dutton, Tyngsboro', *President;* Dr. W. Bass, Lowell, *Vice-President;* Dr. G. C. Osgood, Lowell, *Secretary;* Dr. N. B. Edwards, North Chelmsford, *Treasurer;* Dr. W. B. Jackson, Lowell, *Librarian.*

MIDDLESEX SOUTH.—Dr. J. L. Sullivan, Malden, *President;* Dr. Z. B. Adams, Framingham, *Vice-President;* Dr. D. M. Edgerly, Cambridgeport, *Secretary;* Dr. J. W. Willis, Waltham, *Treasurer;* Dr. W. Ela, Cambridge, *Librarian.*

NORFOLK.— *President;* Dr. J. H. Streeter, Roxbury, *Vice-President;* Dr. G. D. Townshend, Roxbury, *Secretary and Librarian;* Dr. E. G. Morse, Roxbury, *Treasurer.*

PLYMOUTH.—Dr. B. F. Hastings, South Abington, *President;* Dr. J. C. Gleason, Rockland, *Vice-President;* Dr. J. E. Bacon, Brockton, *Secretary and Treasurer;* Dr. A. A. MacKeen, South Abington, *Librarian.*

SUFFOLK.—Dr. R. M. Hodges, Boston, *President;* Dr. J. C. White, Boston, *Vice-President;* Dr. H. C. Haven, Boston, *Secretary;* Dr. E. M. Buckingham, Boston, *Treasurer;* Dr. B. J. Jeffries, Boston, *Librarian.*

WORCESTER.—Dr. E. B. Harvey, Westboro', *President;* Dr. A. Wood, Worcester, *Vice-President;* Dr. J. B. Rich, Worcester, *Secretary;* Dr. J. O. Marble, Worcester, *Treasurer;* Dr. L. Wheeler, Worcester, *Librarian.*

WORCESTER NORTH.—Dr. J. P. Lynde, Athol, *President;* Dr. R. F. Andrews, Gardner, *Vice-President;* Dr. F. W. Russell, Winchendon, *Secretary;* Dr. E. P. Miller, Fitchburg, *Treasurer;* Dr. C. H. Rice, Fitchburg, *Librarian.*

Massachusetts Medical Society.

PROCEEDINGS OF THE COUNCILLORS.

OCTOBER 4, 1882.

A STATED MEETING of the Councillors was held in the Hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Wednesday, October 4, 1882, at 11 o'clock, A.M.

The President, Dr. ALFRED HOSMER, in the chair.

The following Councillors were present:

Bristol North.
S. D. Presbrey.

Bristol South.
F. H. Hooper,
G. T. Hough,
J. H. Mackie,
A. B. Paun.

Essex North.
C. G. Carleton,
H. J. Cushing,
M. Roberts,
C. C. Talbot,
O. Warren.

Essex South.
D. Coggin,
W. W. Eaton,
J. S. Emerson,
A. H. Johnson,
C. C. Pike.

Middlesex East.
F. F. Brown,
J. M. Harlow,
F. Winsor.

Middlesex North.
C. Dutton,
S. W. Fletcher,
L. S. Fox,
F. Nickerson,
G. E. Pinkham.

Middlesex South.
T. Crozier,
J. G. Dearborn,
E. W. Emerson,
R. L. Hodgdon,
H. Holmes,
A. Hosmer,
H. E. Marion,
A. L. Norris,
C. E. Spring,
E. H. Stevens,
L. R. Stone,
G. J. Townsend,
C. E. Vaughan,
W. W. Wellington,
R. Willis.

Norfolk.
R. Amory,
H. P. Bowditch,
G. A. Bragdon,
B. Cushing,
J. S. Flint,
J. S. Greene,
C. C. Hayes,
E. Mead,
H. G. Morse,
D. B. Van Slyck,
U. O. B. Wingate.

Plymouth.
N. P. Brownell,

J. C. Gleason,
Asa Millet,
A. E. Paine.

Suffolk.
S. L. Abbot,
J. Ayer,
H. H. A. Beach,
C. J. Blake,
D. W. Cheever,
H. Curtis,
F. W. Draper,
T. Dwight,
C. F. Folsom,
W. H. H. Hastings,
R. M. Hodges,
C. D. Homans,
W. Ingalls,
F. I. Knight,
G. H. Lyman,
F. Minot,
C. B. Porter,
J. P. Reynolds,
W. L. Richardson,
G. C. Shattuck,
B. S. Shaw,
A. M. Sumner,
C. W. Swan,
W. G. Wheeler,
H. W. Williams.

Worcester.
A. G. Blodgett.
F. D. Brown,
E. B. Harvey,
W. M. Parker,
L. Wheeler.

Worcester North.
G. D. Colony,
Ira Russell,

Total, 85.

The record of the last meeting was read and accepted.

On nomination by the President, the following were appointed delegates to other State Medical Societies:

Vermont.—Drs. J. P. Lynde, of Athol; O. F. Bigelow, of Amherst.
New York.—Drs. H. W. Williams, W. Ingalls, of Boston.

The Committee on Membership and Resignations reported through its chairman, Dr. Ayer, and recommended that the following be permitted to resign:

Drs. Charles F. Ober, of Peterboro', N. H.
Edward D. Peters, Jr., of Ely, Vt.

Also, that the following be placed on the retired list:

Drs. Nelson B. Tanner, of North Abington.
Charles Warren, of Manchester, N. H.

Also, that the following forfeit their membership by removal from the State and non-payment of assessments:

Drs. E. B. Aldrich, of Manchester, N. H.
J. H. Bean, of Denver, Col.
H. A. Bailey, of Monterey, Miss.
J. H. Day, of Middletown, Conn.
M. P. Eayrs, of West Rutland, Vt.
G. W. Marsters, of Cawker City, Kan.
L. J. Warren, of Clay Centre, Kan.
J. O. Whitney, of Pawtucket, R.I.

The report of the Committee was accepted, and its recommendations were adopted.

Voted,—That Thomas Delap Smith, of Auburndale, be restored to membership in the Society.

Adjourned at 11.30, A.M.

FRANCIS W. GOSS,
Recording Secretary.

FEBRUARY 7, 1883.

A STATED MEETING of the Councillors was held in the Hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Wednesday, Feb. 7, 1883, at 11 o'clock, A.M.

The President, Dr. ALFRED HOSMER, in the chair.

The following Councillors were present:

Barnstable.
P. Pineo.

Berkshire.
L. Miller.

Bristol North.
S. D. Presbrey.

Bristol South.
F. H. Hooper.
A. B. Paun.

Essex North.
O. D. Cheney.

Essex South.
D. Coggin,
W. W. Eaton,
J. S. Emerson,
W. B. Goldsmith,
J. W. Goodell,
A. H. Johnson,
G. S. Osborne,
A. M. Tupper.

Middlesex East.
F. F. Brown.
J. M. Harlow,
F. Winsor.

Middlesex North.
S. W. Fletcher,
L. S. Fox,
F. Nickerson,
G. E. Pinkham.

Middlesex South.
T. Crozier,
R. L. Hodgdon,
H. Holmes,
A. Hosmer,
A. L. Norris,
C. E. Spring,
L. R. Stone,
C. E. Vaughan,
A. C. Webber,
W. W. Wellington,
R. Willis,
M. Wyman.

Norfolk.
R. Amory,
H. P. Bowditch,
G. A. Bragdon,
J. S. Flint,
J. S. Greene,
C. C. Hayes,
H. G. Morse,
J. Seaverns,
U. O. B. Wingate.

Plymouth.
Asa Millet,
A. E. Paine.

Suffolk.
S. L. Abbot,
J. Ayer,

H. H. A. Beach,
C. J. Blake,
H. I. Bowditch,
D. W. Cheever,
H. Curtis,
F. W. Draper,
R. H. Fitz,
C. F. Folsom,
J. O. Green,
S. A. Green,
F. B. Greenough,
W. H. H. Hastings,
D. H. Hayden,
C. D. Homans,
J. Homans,
B. J. Jeffries,
F. I. Knight,
G. H. Lyman,
F. Minot,
C. B. Porter,
G. C. Shattuck,
B. S. Shaw,
A. D. Sinclair,
C. W. Swan,
G. G. Tarbell,
J. C. Warren,
W. G. Wheeler,
E. N. Whittier.

Worcester.
G. E. Francis,
E. B. Harvey.

Worcester North.
R. F. Andrews,
G. Jewett.

Total, 78.

The record of the last meeting was read and accepted.

On nomination by the President the following were appointed delegates to other State Medical Societies:

Maine.—Drs. J. Ayer, of Boston; G. D. Colony, of Fitchburg.

New Hampshire.—Drs. F. H. Hooper, of New Bedford; C Dutton, of Tyngsboro'.

Rhode Island.—Drs. T. H. Gage, of Worcester; W. N. Stone, of Wellfleet.

Connecticut.—Drs. S. L. Abbot, of Boston; G. J. Townsend, of South Natick.

New Jersey.—Drs. H. P. Walcott, of Cambridge; G. H. Pillsbury, of Lowell.

The following Committees were appointed:

To Audit the Treasurer's Accounts.—Drs. L. R. Stone, C. C. Tower.

To Examine the Library.—Drs. C. B. Porter, O. W. Doe.

To Examine the By-Laws of District Societies.—Drs. A. Millet, S. D. Presbrey, J. C. White.

The Committee on Membership and Resignations recommended, and it was voted, that the following be allowed to retire:

Dr. Benjamin Hubbard, of Plymouth.

Also, that the following be allowed to resign:

Dr. Josiah N. Hall.

Also, that the following be dropped from the roll for delinquency in dues:

Drs. R. B. Jordan, of Swampscott.
F. W. Adams, of Royalston.
C. M. Sawyer, of Haverhill.

Voted, that Dr. Alexander Spear McClean, of Springfield, be restored to Fellowship.

Dr. Shattuck, for the Committee appointed in June, 1882, to report on the subject of admission to the Society, stated that it would manifestly be very undesirable to apply to the Legislature for any modification of the charter. Experience proves that By-laws should not be abrogated or modified except for urgent cause. Our present system of admission comes from much deliberation and experience, and is the growth of many years. Much is being done, and more may still be done, to promote its wise administration. It has not been thoroughly tried, and we should surely wait till this has been done before we start on a new departure.

The Committee offered several resolutions, of which, after considerable discussion, the following were passed:

Resolved, That the Councillors of the Massachusetts Medical Society hereby call upon District Societies to exercise great discretion and care in the choice of Censors; and exhort all Censors to a faithful and painstaking discharge of their duties as set forth in the By-Laws and Rules.

Resolved, That the Councillors hereby express their approval of stated and occasional meetings of all the Censors—who may thus confer as to how their responsible duties may be performed to the greatest advantage of the important interests intrusted to them—and recommend a continuance of these meetings.

Resolved, That the Councillors hereby call the attention of District Societies and Censors to the following matters of great importance:

All Censors must be elected by ballot, and can be elected at the Annual Meetings only of District Societies.

No Censor can act as such unless he be present at the meeting. No Censor can act by deputy.

No Board of Censors can hold a special meeting, or adjourn except to a specified time and place.

Every Board except the Suffolk Board must hold a meeting whenever there is a stated meeting of its District Society.

Resolved, that a copy of these resolutions be sent by the Secretary to every Censor and to every Secretary of a District Society.

A communication was presented from the Berkshire District Medical Society, protesting against the existing laws of the State regarding the Registration of Births and Deaths, and requesting the Councillors to petition the Legislature for proper compensation to the profession for the performance of duties which the laws demand. After discussion, on motion of Dr. Amory, it was

Voted,—That a Committee of five be appointed to present the memorial of the Berkshire District Medical Society, in regard to the repeal or modification of the Registration Law, and to appear in behalf of the Massachusetts Medical Society before the Legislature, to request a repeal or modification of Sections 7 and 9, Chap. 32, of the Public Statutes.

The following were appointed to constitute the committee:

Drs. R. Amory, H. Holmes, A. H. Cowdrey, E. B. Harvey, L. Miller.

Adjourned at 12.30, P.M.

FRANCIS W. GOSS,
Recording Secretary.

Annual Meeting.

The Annual Meeting of the Councillors was held in the Hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Tuesday, June 12, 1883, at 7 o'clock, P.M.

The President, Dr. Alfred Hosmer, in the chair.

The following Councillors were present:

Barnstable.
F. W. Pierce,
J. E. Pratt.

Berkshire.
C. W. Burton,
W. W. Leavitt,
L. Miller.

Bristol North.
S. D. Presbrey.

Bristol South.
G. Atwood,
F. H. Hooper,
F. A. Sawyer,
J. J. B. Vermyne.

Essex North.
C. G. Carleton,
O. D. Cheney,
O. Warren.

Essex South.
D. Coggin,
H. Colman,

W. W. Eaton,
J. S. Emerson,
A. H. Johnson,
C. A. Lovejoy,
C. C. Pike,
H. R. Stedman.

Franklin.
A. C. Deane,
C. M. Duncan.

Hampden.
T. F. Breck,
T. L. Chapman,
G. E. Fuller,
S. F. Smith.

Hampshire.
J. Dunlap,
J. M. Fay,
D. B. N. Fish,
J. Yale.

Middlesex East.
A. H. Cowdrey,
J. M. Harlow,
F. Winsor.

Middlesex North.
L. Howard,
M. G. Parker,
G. E. Pinkham.

Middlesex South.
T. Crozier,
S. W. Driver,
J. B. Everett,
S. Hanscom,
R. L. Hodgdon,
A. Hosmer,
O. E. Hunt,
F. D. Lord,
H. E. Marion,
A. L. Norris,
C. E. Spring,
E. H. Stevens,
L. R. Stone,
G. J. Townsend,
C. E. Vaughan,
A. C. Webber,
W. W. Wellington,
R. Willis.

Norfolk.
R. Amory,
H. P. Bowditch,
G. A. Bragdon,
B. Cushing,
T. T. Cushman,
J. S. Greene,
C. C. Hayes,
I. H. Hazelton,
A. R. Holmes,
J. Seaverns,
C. C. Tower,
D. B. Van Slyck,
J. A. Winkler.

Plymouth.
H. W. Dudley,
J. C. Gleason,
Asa Millet,
A. E. Paine.

Suffolk.
S. L. Abbot,
J. Ayer,
H. H. A. Beach,
H. J. Bigelow,
C. J. Blake,
H. I. Bowditch,
S. Cabot,
D. W. Cheever,
O. W. Doe,
F. W. Draper,
T. Dwight,
R. H. Fitz,
C. F. Folsom,
J. O. Green,
S. A. Green,
F. B. Greenough,
W. H. H. Hastings,
R. M. Hodges,
C. D. Homans,
J. Homans,
W. Ingalls,
F. I. Knight,
G. H. Lyman,
F. Minot,
C. B. Porter,
J. P. Reynolds,
W. L. Richardson,
G. C. Shattuck,
B. S. Shaw,
A. D. Sinclair,
A. M. Sumner,
C. W. Swan,
G. G. Tarbell,
O. F. Wadsworth,
J. C. Warren,
T. Waterman,
J. C. White,
E. N. Whittier,
H. W. Williams.

Worcester.
F. W. Brigham,
G. Brown,
G. E. Francis,
T. H. Gage,
E. B. Harvey,
J. M. Rice,
W. E. Rice,
E. Warner,
G. C. Webber,
J. O. West,
L. Wheeler.

Worcester North.
R. F. Andrews,
G. D. Colony,
G. Jewett,
Ira Russell,
F. H. Thompson.

Total, 127.

The record of the previous meeting was read and accepted.

The names of the Nominating Committee, as chosen by the District Societies, were announced.

The Committee was composed as follows:

Drs. S. D. Presbrey, ...	Bristol North.
F. A. Sawyer, . . .	Bristol South.
C. G. Carleton, . . .	Essex North.
J. S. Emerson, . . .	Essex South.
A. C. Deane, . . .	Franklin.
T. L. Chapman, . . .	Hampden.
D. B. N. Fish, . . .	Hampshire.
G. E. Pinkham, . . .	Middlesex North.
R. L. Hodgdon, . . .	Middlesex South.
J. M. Harlow, . . .	Middlesex East.
R. Amory, . . .	Norfolk.
A. Millet, ...	Plymouth.
G. C. Shattuck, . . .	Suffolk.
T. H. Gage, . . .	Worcester.
I. Russell, ...	Worcester North.

Barnstable and Berkshire Districts having failed to appoint, Drs. F. W. Pierce and W. W. Leavitt were selected to represent those Districts respectively.

The Secretary read the names of new and of deceased Fellows.

The Treasurer, Dr. Draper, read his annual report.

The Auditing Committee reported that they found the accounts properly vouched and correctly cast; also that they examined the evidences of the Society's funded property, and found the same safely kept.

The Treasurer's report was then accepted.

The Committee on Finances reported through Dr. Homans, and recommended that $1308.50, being eighty-five per cent. of the balance remaining in the treasury, be distributed among the District Societies. Adopted.

The Committee on Membership and Resignations reported through Dr. Ayer. In accordance with their recommendation, the following were allowed to resign:

Drs. Abel Huntington, of New York, N. Y.
David F. Lincoln, of Reading, Pa.

Also, the following were allowed to retire:

Drs. T. L. Chapman, of Longmeadow.
E. W. Drake, of Middleboro'.
E. T. Learned, of Fall River.
J. L. Wellington, of Swansea.
S. L. Young, of Ferry Village, Me.
David Youngman, of Boston.

The Committee on Publications reported through Dr. Shattuck.

The Committee on By-Laws of the District Societies reported through Dr. Millet, and stated that they had examined the By-Laws of the various District Societies and found them in general harmony with the By-Laws of the State Society and the Laws of the State.

The Committee to examine the Library reported through Dr. Doe.

The Committee to which was referred the petition from Berkshire and Norfolk District Societies, "concerning Registration of Births and Deaths," reported through Dr. Amory, that its members petitioned the Legislature, in the name of the Massachusetts Medical Society, to repeal or amend the Statute (chap. 32, sec. 7 & 9, Public Statutes), (Acts of 1880, 33, § 1), and requested a hearing; that a hearing was granted, and the Committee presented a strong argument against the injustice of the Statute, which affixed a penalty for non-performance of clerical work for which the Commonwealth paid nothing. The Committee requested that physicians (and midwives) be allowed a fee for each birth reported, or else that the compulsory duty be abrogated. The Judiciary Committee of the Senate, who heard the Committee, were favorably disposed to recommend the request for a fee, but were averse to granting a repeal, and were also indisposed to grant a fee for reporting deaths. Inasmuch as the attending physician is required

to report a death only when applied to by a member of the family of the deceased, this request was not pressed by the Committee. The Act, as amended by the Legislature, is as follows:

CHAPTER 158.

AN ACT in relation to the returns of births by physicians and midwives.

Be it enacted by the senate and house of representatives in General Court assembled, and by the authority of the same, as follows:—

SECTION 1. Section seven of chapter thirty-two of the Public Statutes is amended so as to read as follows: "Section 7. Physicians and midwives shall, on or before the fifth day of each month, report to the clerk of each city or town, except Boston, a correct list of all children born therein during the month next preceding, at whose birth they were present, stating the date and place of each birth, the name of the child (if it has any), the sex and color of the child, the name, place of birth and residence of the parents, and the occupation of the father. The fee of the physician or midwife shall be twenty-five cents for each birth so reported, and shall be paid by the city or town in which the report is made.

SECT. 2. This act shall take effect upon its passage."

Approved May 3, 1883.

Dr. Harlow announced the following awards to writers of essays in competition for the Clough Prizes:—

To Samuel Delano, of Boston, the first prize of $50.00.

To D. Waterhouse Niles, of Worcester, the second prize of $30.00.

To Herbert S. Johnson, of Boston, the third prize of $20.00.

The Committee on Nominations, through Dr. Shattuck, reported a list of candidates for the offices of the Society for the ensuing year, and the same were elected by ballot:

President . .	Dr. ALFRED HOSMER, of Watertown.
Vice President . .	Dr. IRA RUSSELL, of Winchendon.
Treasurer . .	Dr. FRANK W. DRAPER, of Boston.
Corresponding Secretary	Dr. CHARLES W. SWAN, of Boston.
Recording Secretary .	Dr. FRANCIS W. GOSS, of Roxbury.
Librarian . .	Dr. DAVID H. HAYDEN, of Boston.

Dr. JOHN CROWELL, of Haverhill, was chosen Orator, and

Dr. ROBERT AMORY, of Brookline, Anniversary Chairman, for the next Annual Meeting.

Voted,—That the next Annual Meeting be held in Boston, on the second Wednesday in June, 1884.

On nomination by the President, the following Standing Committees were appointed:

Of Arrangements.

C. E. Wing, H. C. Haven, J. W. Elliot,
A. T. Cabot, C. H. Williams, Frank H. Hooper.

On Publications.

G. C. Shattuck, R. M. Hodges, B. E. Cotting.

On Membership and Resignations.

J. Ayer, F. Minot, D. W. Cheever.

On Finances.

C. D. Homans, W. W. Wellington, B. S. Shaw.

To Procure Scientific Papers.

C. W. Swan, F. K. Paddock, G. S. Stebbins,
J. R. Chadwick, R. H. Fitz.

On Ethics and Discipline.

G. J. Townsend, G. E. Francis, A. H. Johnson,
C. Howe, F. C. Shattuck.

On Medical Diplomas.

W. L. Richardson, A. H. Cowdrey, E. J. Forster.

Dr. A. N. Blodgett, for the General Censors' Meeting, presented a communication from that body, stating that in their opinion the Boards of Censors for the District Societies are at liberty to hold special meetings at their pleasure, whether for the examination of candidates, or for any other purpose within their functions, and expressing the hope that the Councillors would take favorable action thereon.

Voted,—That the communication be referred to Drs. E. H. Bradford, A. N. Blodgett and J. T. G. Nichols, as a Committee to report at the next meeting.

Dr. Hodgdon moved the following:

Voted,—That the first four lines of By-Law I. be stricken out, and the following be put in their place, viz.:—

Candidates for admission into the Massachusetts Medical Society may be either male or female; and every candidate must, by proper credentials and examination, satisfy the Censors of said

Society that he possesses the following qualifications for fellowship:—

A prolonged and animated discussion ensued, in which Drs. Williams, Hodgdon, Bowditch, Shattuck, H. P. Bowditch and Harvey took part. A motion was carried that the vote be taken by ayes and noes. One hundred and twenty responded to the call of the roll. The original motion was rejected by a vote of 58 ayes to 62 noes.

Adjourned at 9.15, P.M.

FRANCIS W. GOSS,
Recording Secretary.

Massachusetts Medical Society.

PROCEEDINGS OF THE SOCIETY.

ANNUAL MEETING.

First Day.

The Society met in Huntington Hall, at the Institute of Technology, Boston, on Tuesday, June 12, 1883, at 12 o'clock, M.

The Vice President, Dr. J. H. Mackie, in the Chair.

The following papers were read:

1. A Contribution to the Study of the Tubercle-Bacillus.—By H. C. Ernst, M.D., of Jamaica Plain.

The paper was discussed by Drs. Whitney, Fitz and Bowditch.

2. The Use and Abuse of Ergot.—By G. L. Woods, M.D., of Springfield.
3. The Use and Abuse of Ergot.—By W. A. Dunn, M.D., of Boston.

Adjourned at 2 o'clock, P.M.

At 3 o'clock, P.M., the reading of papers was resumed.

4. Glykogen.—By J. W. Warren, M.D., of Boston.

Dr. H. P. Bowditch made remarks regarding this paper.

5. Phlyctenular Disease of the Eyes. — By O. F. Wadsworth, M.D., of Boston.
6. Minor Injuries of the Spinal Cord.—By B. H. Hartwell, M.D., of Ayer.

7. Plumbing Appliances.—By T. M. Clark, A.B., Professor of Architecture, Institute of Technology.

Adjourned at 5.30, P.M.

FRANCIS W. GOSS,
Recording Secretary.

Second Day.

The Society met in Huntington Hall, Boston, on Wednesday, June 13, 1883, at 9 o'clock, A.M., for the Anniversary Exercises.

The President, Dr. Alfred Hosmer, in the Chair.

The record of the last Annual Meeting was read and accepted.

The Secretary read the names of Fellows admitted since the last Annual Meeting, and of Fellows whose deaths had been reported.

Fellows admitted since June 13, 1882.

1882	Adams, Henry Fiske	Newburyport.
1882	Aiken, William Henry	Malden.
1883	Atkins, Edgar Chester	Milford.
1883	Baker, David Erastus	Boston.
1882	Banfield, Francis Loring	Worcester.
1883	Best, Enoch George	Turner's Falls.
1882	Bigelow, Charles Edwin	Leominster.
1883	Bigelow, Frederick Fremont	Worcester.
1882	Blanchard, Benjamin Seaver	Roxbury.
1882	Bradley, Charles How	Haverhill.
1882	Brewer, Charles Dodd	Springfield.
1883	Briggs, Frederick Melancthon	Boston.
1883	Broderick, Thomas Joseph	Charlestown.
1883	Burr, Charles Henry	Boston.
1883	Chandler, Henry Beckles	Boston.
1882	Cheever, Clarence Alonzo	Jamaica Plain.
1883	Chisholm, William Palmer	Brockton.
1882	Clark, Maurice Dwight	Haverhill.
1882	Conway, James Henry	Woburn.
1883	Cushman, Ruggles Allerton	Shirley Village.
1882	Daly, Bernard Thomas	Abington.

1883	Drake, William Abram . .	North Weymouth.
1882	Dunbar, Franklin Asaph . .	Boston.
1883	Ellis, Dean Samuel . . .	Worcester.
1882	Fales, William Henry . . .	Boston.
1883	Flagg, Herbert Horatio . .	Shelburne Falls.
1883	Fogerty, William Clemmons . .	Worcester.
1883	Forbes, Alexander Allen . .	Springfield.
1883	Foster, Horace Kendall . . .	Peabody.
1882	Galligan, Eugene Thomas . .	Roxbury.
1883	Galloupe, Charles William . .	Lynn.
1883	Geoffrion, Joseph Philias . .	Salem.
1883	Goodhue, Perley Eben . . .	Methuen.
1883	Gruver, Samuel James . . .	Brockton.
1882	Hall, David Graham . . .	Northampton.
1883	Harriman, Samuel Knight . .	Natick.
1883	Harrington, Charles . . .	Boston.
1883	Harwood, Charles William . .	Worcester.
1882	Hastings, Judson Worthington .	Feeding Hills.
1883	Haven, George	Boston.
1882	Hitchcock, Edward, Jr. . . .	Amherst.
1882	Hodgdon, Andrew Hall . .	Boston.
1883	Hoitt, Eugene Gorham . .	Marlborough.
1882	Holden, Charles Sumner . .	Boston.
1883	Holden, William Daniel . .	Haverhill.
1882	Holmes, William Dennison . .	Boston.
1883	Howard, George Canning . .	Lawrence.
1883	Hubbard, Rufus Peabody . .	Boston.
1882	Hunter, Dwight Williams . .	Springfield.
1882	Huse, Charles Archelaus . .	Worcester.
1882	Johnson, Herbert Shattuck . .	Boston.
1883	Johnson, William Augustus . .	Lowell.
1883	Kellogg, Edward Brinley . .	Boston.
1883	Mackin, Charles	Milford.
1883	McCormack, Alexander Leslie .	East Boston.
1883	McGannon, Edward Aaron . .	Lowell.
1882	McOwen, William Henry . .	Lowell.
1882	Mixter, Orlando	Worcester.
1882	Murphy, Joseph Briggs . .	Boston.
1883	Messer, Charles Carson . .	Turner's Falls.
1883	Otterson, William David . .	Tewksbury.
1883	Perkins, Eben Meade . . .	Worcester.
1883	Perry, George Lewis . . .	Baldwinville.
1882	Pierce, Matthew Vassar . .	Milton.
1883	Porter, Omer Pillsbury . .	Lowell.
1883	Reed, William Gilman . .	Sturbridge.
1883	Richards, George Edward . .	Cambridge.
1883	Richardson, Dana Putnam . .	North Leominster.

1883	Robinson, James Arthur	Taunton.
1883	Roche, Thomas Francis	Clinton.
1883	Rundlett, Henry Albert Pierce	Lowell.
1882	Ryder, Godfrey, Jr.	Malden.
1883	Sanborn, Frederic James	Holden.
1883	Sawyer, Edward Allen	Gardner.
1882	Scott, Frederick	Worcester.
1883	Shea, Andrew Francis	Lawrence.
1882	Small, Whitwell Pugh	Great Barrington.
1882	Smith, Howard Hutchins	Boston.
1882	Smith, Willard Everett	Framingham.
1883	Stevens, Frank Dana Switzer	Lynn.
1883	Sullivan, James Francis	Lowell.
1883	Sullivan, James Joseph	Lowell.
1882	Swan, Roscoe Wesley	Worcester.
1883	Tallman, Augustus Littlefield	East Boston.
1882	Tanner, John Alexander	Dorchester.
1883	Thompson, George Eben	Somerville.
1882	Trumbull, John	Boston.
1882	Young, John Francis	South Boston.
		Total, 88.

List of Deceased Fellows.

Admitted.	Name.	Residence.	Date of Death.	Age.
1830	*Almon, William Bruce	Halifax, N. S.	July 12, 1840	52
1861	Bates, Joseph Nye	Worcester	Feb. 22, 1883	72
1844	Bell, Cyrus	Feeding Hills	Sept. 10, 1882	69
1881	Bugbee, LaFayette	South Boston	Sept. 2, 1882	39
1863	Burnham, Walter	Lowell	Jan. 16, 1883	75
1839	Crane, Phineas Miller	East Boston	Aug. 13, 1882	77
1875	Elliot, Daniel Mitchell	Peabody	July 26, 1882	39
1877	Foley, John Barnard	Roxbury	July 25, 1882	32
1846	Gould, Samuel Herrick	Brewster	Aug. 25, 1882	67
1850	*Hayes, Augustus Allen	Boston	June 21, 1882	76
1841	Holmes, Christ'r Columbus	Milton	July 16, 1882	65
1846	Holt, Daniel	Lowell	Apr. 11, 1883	73
1857	Howe, George Marshall	Framingham	Sept. 16, 1882	58
1849	Jennings, John Henry	New Bedford	July 31, 1882	60
1874	Lawton, Sanford	Springfield	July 23, 1882	50
1874	McCarthy, Jeremiah Joseph	Charlestown	Feb. 25, 1883	35
1833	Osborne, George	Peabody	Sept. 21, 1882	83
1841	Parker, James Otis	Shirley	May 2, 1883	71
1866	Parker, William Marshall	Milford	March 1, 1883	54
1841	Prince, William Henry	Newton	May 15, 1883	67
1832	Randall, Menzies Rayner	North Rehoboth.	July 23, 1882	88
1859	Sawyer, Edward Julius	Gardner	May 10, 1883	53
1842	Smith, Alvan	Monson	Aug. 6, 1882	74
1882	Smith, Howard Hutchins	Boston	Oct. 27, 1882	23
1840	Thompson, Daniel	Northampton	May 25, 1883	83
1865	Turner, Obed Chester	No. Cambridge	Oct. 31, 1882	42
1855	Walker, Clement Adams	Boston	Apr. 26, 1883	62

* Honorary. Total, 27.

The Treasurer, Dr. Draper, read his Annual Report.

Voted,—On motion of Dr. H. P. Bowditch, That a committee of three be appointed by the Chair to memorialize Congress in regard to the disposition and care of the library of the Surgeon General's office, and to urge upon our Representatives the importance of providing a fire-proof building for its preservation in connection with the museum, and distinct from the general congressional library, and also of securing a liberal appropriation for the completion of the index catalogue and for the general purposes of the library.

Drs. H. P. Bowditch, H. P. Wolcott and O. F. Wadsworth were appointed to constitute this Committee.

On motion of Dr. Hodgdon it was

Voted,—That when this Society adjourns to-day, it be to meet at 4, P.M., on Tuesday preceding the day of the Annual Meeting in June, 1884, and that the Secretary be requested to procure a place for the meeting.

Papers were read as follows:

8. RECENT CHANGES IN THE METHOD OF MEDICAL INSTRUCTION.—By E. N. Whittier, M.D., of Boston.
9. NEURASTHENIA; ITS CAUSES AND ITS HOME TREATMENT.—By J. S. Greene, M.D., of Dorchester.
10. THE ARTIFICIAL FEEDING OF INFANTS.—By J. W. Spooner, M.D., of Hingham.
11. THE EARLY SYMPTOMS OF GENERAL PARALYSIS OF THE INSANE.—By W. B. Goldsmith, M.D., of Danvers.

The following Delegates from other State Medical Societies were introduced:

Maine.—Dr. C. E. Webster.
New Hampshire.—Drs. T. J. W. Pray, L. J. Young.
Vermont.—Drs. E. R. Campbell, George Dunsmore.
Rhode Island.—Drs. G. T. Swarts, H. G. Miller.
Connecticut.—Dr. F. E. Beckwith.
New York.—Drs. E. N. Brush, G. G. Hopkins, P. V. S. Pruyn.
Pennsylvania.—Dr. Alice Bennett.

Dr. Swarts made a brief address.

At 12 o'clock the Annual Discourse was delivered by Dr. AMOS H. JOHNSON, of Salem.

At the close of the oration the Society presented a vote of

thanks to the orator for his able, interesting, and scholarly address.

At 1, P.M., the Society adjourned to the Winslow Skating Rink, where dinner was served to more than seven hundred Fellows.

FRANCIS W. GOSS,
Recording Secretary.

TREASURER'S REPORT.

The following report upon the finances of the Society for the year ending April 15, 1883, is respectfully submitted. The receipts during the year amounted to $8,595.79, and the total disbursements were $7,056.37; the items are set forth in the accompanying analysis. A balance of $1,539.42 remaining at the end of the year is evidence that the Treasury has recovered from the temporary drain incident to the Centennial Anniversary of the Society.

The invested funds have remained unchanged during the year; they amount to $32,420.17, yielding interest at the rate of four per cent. per annum.

It is gratifying to report the fact that the Fellows of the Society have shown recently an increasing disposition to pay the annual assessment with promptness; most of the District Societies, responding to the energetic efforts of their Treasurers, very nearly cancelled their assessment-accounts for the year just closed, so that the list of delinquents in the various Districts was shorter at the end of this year than ever before, although the membership of the Society has received large accessions. Many individual instances of delinquency in the payment of dues have been investigated, and, in cases found worthy of indulgence, the Councillors, upon the recommendation of the Finance Committee, have remitted the dues, wholly or in part; the total

amount thus remitted for good cause during the year was $90.00. On the other hand, among those in arrears, there are always some who never manifest any interest in the Society in any way, and who never respond to the Treasurer's overtures; of this class, three have been dropped from the roll of Fellows during the past year, by vote of the Council, in accordance with the provisions of By-Law V. Under the terms of By-Law VI., the Councillors have also dropped from the roll of Fellows the names of eight who, having removed from the State, have failed to pay their assessments for several years. The membership of the Society at the present time includes 1484 names.

F. W. DRAPER,

BOSTON, June 7, 1883. *Treasurer.*

BOSTON, May 26, 1883.

The Committee appointed to examine the Treasurer's accounts have attended to that duty, and would report that they found the accounts properly vouched and correctly cast; also that they examined the evidences of the Society's funded property, and found the same safely kept.

LINCOLN R. STONE, } *Auditing*
CHARLES C. TOWER, } *Committee.*

DR. **F. W. Draper, Treasurer, in Account with**

INCOME.

Balance from last account		$710 05
Assessments paid to the Treasurer		1102 50
Assessments collected by the DISTRICT TREASURERS:—		
Barnstable	$95 00	
Berkshire	200 00	
Bristol North	140 00	
Bristol South	185 00	
Essex North	265 00	
Essex South	265 00	
Franklin	65 00	
Hampden	235 00	
Hampshire	175 00	
Middlesex East	110 00	
Middlesex North	315 00	
Middlesex South	370 00	
Norfolk	605 00	
Plymouth	170 00	
Suffolk	1680 00	
Worcester	470 00	
Worcester North	115 00	
		5460 00
Interest account:—		
General Fund	450 12	
Shattuck Fund	366 67	
Phillips Fund	400 00	
Cotting Fund	70 00	
Interest on balance deposited with New England Trust Co.	36 25	
		1323 04
Sale of Publications		20
		$8595 79

the Massachusetts Medical Society. Cr.

EXPENSE.

On account of Annual Meeting, 1882:—		
Caterer's bill	$1312 50	
The Exhibition expenses	161 35	
Horticultural Hall	150 00	
Incidentals	22 79	
Music	25 00	
Music Hall	204 00	
Printing	10 75	
		$1886 39
Ethics and Discipline:—		
Mileage of Committee	20 00	
Expenses of Boards of Trial	37 10	
		57 10
Committee on Publications:—		
Braithwaite's Retrospect	2110 00	
Printing Annual Publications, 1882	281 32	
		2391 32
Councillors' Orders:—		
Lunches at Stated Meetings		60 00
On District Societies' Account:—		
Censors' fees	234 00	
Dividend, 1882	710 05	
Printing for Censors at large	4 75	
Treasurers' fees and expenses	305 13	
		1253 93
Librarian's Expenses:—		
Clerical assistance, two years	100 00	
Postage	266 08	
Printing	4 75	
Stationery	11 50	
		382 33
Recording Secretary's Expenses:—		
Incidentals	1 25	
Postage	53 50	
Printing	66 80	
Salary	250 00	
Stationery	14 25	
		385 80
Rent		150 00
Treasurer's Expenses:—		
Incidentals	12 00	
Postage	27 20	
Printing	46 55	
Salary	400 00	
Stationery	3 75	
		489 50
		7056 37
Balance to new account		1539 42
		$8595 79

Officers of the Massachusetts Medical Society.
1883–84.

Chosen June 12, 1883.

ALFRED HOSMER,	. Watertown,	. PRESIDENT.
IRA RUSSELL . . .	. Winchendon,	. VICE-PRESIDENT.
FRANK W. DRAPER,	. Boston, .	. TREASURER.
CHARLES W. SWAN,	. Boston, .	. COR. SECRETARY.
FRANCIS W. GOSS,	. Roxbury,	. REC. SECRETARY.
DAVID H. HAYDEN,	. Boston, .	. LIBRARIAN.
JOHN CROWELL. .	. Haverhill,	. ORATOR.
ROBERT AMORY, .	. Brookline,	. ANNIV. CHAIRMAN.

Standing Committees.

Of Arrangements.

C. E. WING, C. H. WILLIAMS,
A. T. CABOT, J. W. ELLIOT,
H. C. HAVEN, F. H. HOOPER.

On Publications.

G. C. SHATTUCK, R. M. HODGES, B. E. COTTING.

On Membership and Resignations.

J. AYER, F. MINOT, D. W. CHEEVER.

On Finances.

C. D. HOMANS, W. W. WELLINGTON, B. S. SHAW.

To Procure Scientific Papers.

C. W. SWAN, F. K. PADDOCK, G. S. STEBBINS,
J. R. CHADWICK, R. H. FITZ.

On Ethics and Discipline.

G. J. TOWNSEND, G. E. FRANCIS, A. H. JOHNSON,
C. HOWE, F. C. SHATTUCK.

On Medical Diplomas.

W. L. RICHARDSON, A. H. COWDREY, F. J. FORSTER.

Presidents of District Societies—Vice-Presidents (Ex-Officiis).

(Arranged according to Seniority.)

J. H. Streeter,	E. B. Harvey,
J. L. Sullivan,	J. G. Pinkham,
C. N. Chamberlain,	W. N. Stone,
J. P. Lynde,	E. C. Coy,
F. A. Sawyer,	A. Ames,
J. C. White,	C. M. Barton,
J. F. A. Adams,	S. W. Bowles,
B. F. Hastings,	J. P. Brown.
C. Dutton,	

Councillors.

Barnstable.—Drs. G. W. Doane, Hyannis; F. W. Pierce, Marston's Mills; J. E. Pratt, Sandwich.

Berkshire.—Drs. O. J. Brown, North Adams; C. W. Burton, Adams; W. W. Leavitt, West Stockbridge; H. J. Millard, North Adams; L. Miller, Stockbridge; A. M. Smith, Pittsfield.

Bristol North.—Drs. J. Murphy, N. Paige, S. D. Presbrey, Taunton; J. E. Totten, Attleboro'.

Bristol South.—Drs. E. P. Abbé, New Bedford; G. Atwood, Fairhaven; J. Dwelly, Fall River; F. H. Hooper, New Bedford; F. A. Sawyer, Wareham; J. J. B. Vermyne, New Bedford.

Essex North.—Drs. C. G. Carleton, Lawrence; O. D. Cheney, Haverhill; H. J. Cushing, Merrimac; A. B. Dearborn, Newburyport; O. H. Johnson, Haverhill; M. Roberts, C. C. Talbot, Lawrence; O. Warren, West Newbury.

Essex South.—Drs. C. A. Carlton, D. Coggin, Salem; H. Colman, Lynn; W. W. Eaton, Danvers; J. S. Emerson, J. W. Goodell, Lynn; A. H. Johnson, A. Kemble, Salem; C. A. Lovejoy, Lynn; G. S. Osborne, C. C. Pike, Peabody; H. R. Stedman, Danvers.

Franklin.—Drs. F. J. Canedy, Shelburne Falls; A. C. Deane, Greenfield; C. M. Duncan, Shelburne.

Hampden.—Drs. T. F. Breck, S. D. Brooks, Springfield; T. L. Chapman, Longmeadow; G. E. Fuller, Monson; G. C. McClean, Springfield; S. F. Smith, Indian Orchard; J. H. Waterman, Westfield.

HAMPSHIRE.—Drs. J. Dunlap, Northampton; J. M. Fay, Haydenville; D. B. N. Fish, Amherst; J. Yale, Ware.

MIDDLESEX EAST.—Drs. A. H. Cowdry, Stoneham; J. M. Harlow, Woburn; F. Winsor, Winchester.

MIDDLESEX NORTH.—Drs. C. M. Fisk, Lowell; S. W. Fletcher, Pepperell; L. S. Fox, Lowell; L. Howard, Chelmsford; F. Nickerson, M. G. Parker, G. E. Pinkham, F. C. Plunkett, H. J. Smith, Lowell.

MIDDLESEX SOUTH.—Drs. R. A. Blood, Charlestown; H. Cowles, Saxonville; T. Crozier, J. G. Dearborn, Charlestown; S. W. Driver, Cambridge; J. B. Everett, Everett; S. Hanscom, Somerville; R. L. Hodgdon, Arlington; A. Hosmer, *President*, Watertown; O. E. Hunt, Newtonville; F. D. Lord, Newton; H. E. Marion, Brighton; A. L. Norris, Cambridgeport; C. E. Spring, Holliston; E. H. Stevens, North Cambridge; L. R. Stone, Newton; G. J. Townsend, So. Natick; C. E. Vaughan, Cambridge; A. C. Webber, W. W. Wellington, Cambridgeport; R. Willis, Somerville.

NORFOLK.—Drs. R. Amory, Brookline; H. P. Bowditch, Jamaica Plain; G. A. Bragdon, B. Cushing, Dorchester; T. T. Cushman, Randolph; J. A. Gordon, Quincy; J. S. Greene, Dorchester; C. C. Hayes, Hyde Park; I. H. Hazelton, Grantville; A. R. Holmes, Canton; E. Mead, J. Seaverns, Roxbury; C. C. Tower, South Weymouth; D. B. Van Slyck, Brookline; J. A. Winkler, Jamaica Plain.

PLYMOUTH.—Drs. J. B. Brewster, Plymouth; H. W. Dudley, Abington; J. C. Gleason, Rockland; A. Millet, East Bridgewater; A. E. Paine, Brockton.

SUFFOLK.—Drs. S. L. Abbot, J. Ayer, H. H. A. Beach, H. J. Bigelow, C. J. Blake, J. G. Blake, H. I. Bowditch, S. Cabot, D. W. Cheever, H. Curtis, H. Derby, O. W. Doe, F. W. Draper, *Treasurer*, T. Dwight, C. Ellis, R. H. Fitz, C. F. Folsom, J. O. Green, S. A. Green, F. B. Greenough, W. H. H. Hastings, D. H. Hayden, *Librarian*, R. M. Hodges, C. D. Homans, J. Homans, W. Ingalls, B. J. Jeffries, F. I. Knight, S. W. Langmaid, G. H. Lyman, F. Minot, C. B. Porter, J. P. Reynolds, W. L. Richardson, G. C. Shattuck, B. S.

Shaw, A. D. Sinclair, D. H. Storer, A. M. Sumner, C. W. Swan, *Corresponding Secretary*, G. G. Tarbell, O. F. Wadsworth, J. C. Warren, T. Waterman, Boston; W. G. Wheeler, Chelsea; J. C. White, E. N. Whittier, H. W. Williams, Boston.

WORCESTER.—Drs. F. W. Brigham, Shrewsbury; G. Brown, Barre; G. E. Francis, T. H. Gage, Worcester; E. B. Harvey, Westboro'; D. W. Hodgkins, East Brookfield; J. G. Park, J. M. Rice, Worcester; W. E. Rice, New England Village; E. Warner, Worcester; G. C. Webber, Millbury; J. O. West, Princeton; L. Wheeler, Worcester.

WORCESTER NORTH.—Drs. R. F. Andrews, Gardner; G. D. Colony, G. Jewett, Fitchburg; I. Russell, *Vice-President*, Winchendon; F. H. Thompson, Fitchburg.

Censors.

BARNSTABLE.—Drs. S. T. Davis, Orleans; B. D. Gifford, Chatham; S. F. Haskins, Yarmouthport; C. M. Hulbert, South Dennis; G. Munsell, Harwich.

BERKSHIRE.—Drs. G. S. Knickerbocker, Stockbridge; F. K. Paddock, Pittsfield; T. Riley, Adams; A. M. Smith, Pittsfield; F. P. Whittlesey, Great Barrington.

BRISTOL NORTH.—Drs. M. C. Golden, C. Howe, W. S. Robinson, Taunton; J. E. Totten, Attleboro'; A. W. Wilmarth, Taunton.

BRISTOL SOUTH.—Drs. S. W. Bowen, R. T. Davis, J. H. Jackson, Fall River; A. M. Pierce, W. H. Taylor, New Bedford.

ESSEX NORTH.—Drs. J. Crowell, Haverhill; D. Dana, F. B. Flanders, Lawrence; R. C. Huse, Georgetown; J. F. Young, Newburyport.

ESSEX SOUTH.—Drs. H. Colman, Lynn; J. P. Fessenden, T. Kittredge, Salem; S. W. Torrey, Beverly; A. M. Tupper, Rockport.

FRANKLIN.—Drs. E. A. Deane, Montague; J. H. Goddard, Orange; J. Trow, Buckland; R. C. Ward, Northfield; T. Womersley, Greenfield.

HAMPDEN.—Drs. C. D. Brewer, F. W. Chapin, D. Clark, Springfield; J. W. Hannum, Ludlow; A. F. Reed, Holyoke.

HAMPSHIRE.—Drs. O. F. Bigelow, Amherst; C. W. Cooper, Northampton; J. M. Fay, Haydenville; D. Pickard, C. Seymour, Northampton.

MIDDLESEX EAST.—Drs. W. S. Brown, Stoneham; S. W. Kelley, Woburn; D. March, Jr., Winchester; C. C. Odlin, C. E. Prior, Melrose.

MIDDLESEX NORTH.—Drs. F. W. Chadbourne, J. J. Colton, L. Huntress, J. C. Irish, T. P. Shaw, Lowell.

MIDDLESEX SOUTH.—Drs. W. A. Bell, Somerville; C. H. Cook, Natick; E. R. Cutler, Waltham; D. M. Edgerly, Cambridgeport; J. T. G. Nichols, Cambridge.

NORFOLK.—Drs. G. W. Clement, E. F. Dunbar, E. L. Farr, J. B. Moran, Roxbury; G. K. Sabine, Brookline.

PLYMOUTH.—Drs. H. F. Borden, E. A. Chase, Brockton; E. D. Hill, B. Hubbard, Plymouth; J. W. Spooner, Hingham.

SUFFOLK.—Drs. A. N. Blodgett, E. G. Cutler, T. M. Rotch, F. C. Shattuck. F. H. Williams, Boston.

WORCESTER.—Drs. W. P. Bowers, Clinton; W. Davis, C. A. Peabody, J. B. Rich, Worcester; J. Wilmarth, Upton.

WORCESTER NORTH.—Drs. J. R. Greenleaf, Gardner; B. H. Hartwell, Ayer; A. O. Hitchcock, L. Pillsbury, Fitchburg; J. M. Randall, Leominster.

Commissioners of Trials.

BARNSTABLE	W. N. Stone	Wellfleet.
BERKSHIRE	A. M. Smith	Pittsfield.
BRISTOL NORTH	N. Paige	Taunton.
BRISTOL SOUTH	J. B. Whitaker	Fall River.
ESSEX NORTH	F. A. Howe	Newburyport.
ESSEX SOUTH	E. Newhall	Lynn.
FRANKLIN	W. M. Wright	Orange.
HAMPDEN	J. H. Waterman	Westfield.
HAMPSHIRE	E. B. Nims	Northampton.
MIDDLESEX EAST	J. S. Clark	Melrose.
MIDDLESEX NORTH	N. Allen	Lowell.

MIDDLESEX SOUTH	E. J. Forster	Charlestown.
NORFOLK	S. E. Stone	Walpole.
PLYMOUTH	W. Peirce	Plymouth.
SUFFOLK	C. W. Swan	Boston.
WORCESTER	J. S. Ames	Holden.
WORCESTER NORTH	G. D. Colony	Fitchburg.

Officers of the District Medical Societies.

BARNSTABLE.—Dr. W. N. Stone, Wellfleet, *President;* Dr. J. E. Pratt, Sandwich, *Vice-President;* Dr. S. F. Haskins, Yarmouthport, *Secretary;* Dr. C. M. Hulbert, South Dennis, *Treasurer and Librarian.*

BERKSHIRE.—Dr. J. F. A. Adams, Pittsfield, *President;* Dr. D. M. Wilcox, Lee, *Vice-President;* Dr. H. Colt, Jr., Pittsfield, *Secretary;* Dr. W. M. Mercer, Pittsfield, *Treasurer;* Dr. W. E. Vermilye, Pittsfield, *Librarian.*

BRISTOL NORTH.—Dr. J. P. Brown, Taunton, *President;* Dr. G. Mackie, Attleboro', *Vice-President;* Dr. E. F. Galligan, Taunton, *Secretary;* Dr. C. Howe, Taunton, *Treasurer;* Dr. M. C. Golden, Taunton, *Librarian.*

BRISTOL SOUTH.—Dr. F. A. Sawyer, Wareham, *President;* Dr. G. T. Hough, New Bedford, *Vice-President;* Dr. A. M. Pierce, New Bedford, *Secretary, Treasurer and Librarian.*

ESSEX NORTH.—Dr. C. N. Chamberlain, Lawrence, *President;* Dr. J. A. Douglass, Amesbury, *Vice-President;* Dr. G. W. Snow, Newburyport, *Secretary and Treasurer.*

ESSEX SOUTH.—Dr. J. G. Pinkham, Lynn, *President;* Dr. A. Kemble, Salem, *Vice-President;* Dr. C. C. Sheldon, Lynn, *Secretary;* Dr. C. C. Pike, Peabody, *Treasurer;* Dr. G. Z. Goodell, Salem, *Librarian.*

FRANKLIN.—Dr. E. C. Coy, Montague City, *President;* Dr. G. R. Fessenden, Ashfield, *Vice-President;* Dr. A. C. Deane, Greenfield, *Secretary, Treasurer and Librarian.*

HAMPDEN.—Dr. S. W. Bowles, Springfield, *President;* Dr. G. S. Stebbins, Springfield, *Vice-President*; Dr. G. C. McClean, Springfield, *Secretary, Treasurer and Librarian.*

HAMPSHIRE.—Dr. C. M. Barton, Hatfield, *President;* Dr. W. Lester, South Hadley, *Vice-President;* Dr. C. W. Cooper, Northampton, *Secretary;* Dr. J. Dunlap, Northampton, *Treasurer;* Dr. C. Seymour, Northampton, *Librarian.*

MIDDLESEX EAST.—Dr. A. Ames, Wakefield, *President;* Dr. J. O. Dow, Reading, *Vice-President;* Dr. G. E. Putney, Reading, *Secretary*; Dr. J. O. Dow, Reading, *Treasurer and Librarian.*

MIDDLESEX NORTH.—Dr. C. Dutton, Tyngsboro', *President;* Dr. W. Bass, Lowell, *Vice-President;* Dr. G. C. Osgood, Lowell, *Secretary;* Dr. N. B. Edwards, North Chelmsford, *Treasurer;* Dr. W. B. Jackson, Lowell, *Librarian.*

MIDDLESEX SOUTH.—Dr. J. L. Sullivan, Malden, *President;* Dr. Z. B. Adams, Framingham, *Vice-President;* Dr. W. Ela, Cambridge, *Secretary;* Dr. J. W. Willis, Waltham, *Treasurer;* Dr. W. A. Winn, Arlington, *Librarian.*

NORFOLK.—Dr. J. H. Streeter, Roxbury, *President;* Dr. A. R. Holmes, Canton, *Vice-President;* Dr. G. D. Townshend, Roxbury, *Secretary and Librarian;* Dr. E. G. Morse, Roxbury, *Treasurer.*

PLYMOUTH.—Dr. B. F. Hastings, South Abington, *President;* Dr. J. C. Gleason, Rockland, *Vice-President;* Dr. J. E. Bacon, Brockton, *Secretary and Treasurer;* Dr. A. A. MacKeen, South Abington, *Librarian.*

SUFFOLK.—Dr. J. C. White, Boston, *President;* Dr. G. B. Shattuck, Boston, *Vice-President;* Dr. H. C. Haven, Boston, *Secretary;* Dr. E. M. Buckingham, Boston, *Treasurer;* Dr. B. J. Jeffries, Boston, *Librarian.*

WORCESTER.—Dr. E. B. Harvey, Westboro', *President;* Dr. A. Wood, Worcester, *Vice-President;* Dr. J. B. Rich, Worcester, *Secretary;* Dr. J. O. Marble, Worcester, *Treasurer;* Dr. L. Wheeler, Worcester, *Librarian.*

WORCESTER NORTH.—Dr. J. P. Lynde, Athol, *President;* Dr. R. F. Andrews, Gardner, *Vice-President;* Dr. C. H. Rice, Fitchburg, *Secretary and Librarian;* Dr. E. P. Miller, Fitchburg, *Treasurer.*

Massachusetts Medical Society.

PROCEEDINGS OF THE COUNCILLORS.

October 3, 1883.

A Stated Meeting of the Councillors was held in the hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Wednesday, October 3, 1883, at 11 o'clock, A.M.

The President, Dr. Alfred Hosmer, in the chair.

The following Councillors were present:

Barnstable.
J. E. Pratt.

Berkshire.
C. W. Burton.

Bristol North.
S. D. Presbrey.

Bristol South.
J. Dwelly,
F. H. Hooper,
F. A. Sawyer,
J. J. B. Vermyne.

Essex North.
C. G. Carleton.

Essex South.
D. Coggin,
H. Colman,
W. W. Eaton,
J. W. Goodell,
A. H. Johnson,
A. Kemble,
G. S. Osborne,
C. C. Pike.

Middlesex East.
A. H. Cowdrey,
J. M. Harlow,
F. Winsor.

Middlesex North.
L. S. Fox,
L. Howard,
F. Nickerson,
M. G. Parker,
G. E. Pinkham.

Middlesex South.
T. Crozier,
J. G. Dearborn,
S. Hanscom,
R. L. Hodgdon,
A. Hosmer,
F. D. Lord,
H. E. Marion,
L. R. Stone,
G. J. Townsend,
C. E. Vaughan,
W. W. Wellington,
R. Willis.

Norfolk.
G. A. Bragdon,
B. Cushing,
T. T. Cushman,
J. A. Gordon,
I. H. Hazelton,
A. R. Holmes,
J. Seaverns,
D. B. Van Slyck.

Plymouth.
J. B. Brewster,

H. W. Dudley,
J. C. Gleason.

Suffolk.
S. L. Abbot,
J. Ayer,
H. H. A. Beach,
C. J. Blake,
H. I. Bowditch,
S. Cabot,
D. W. Cheever,
F. W. Draper,
R. H. Fitz,
S. A. Green,
R. M. Hodges,
C. D. Homans,
W. Ingalls,
F. I. Knight,
S. W. Langmaid,
G. H. Lyman,
F. Minot,
C. B. Porter,
B. S. Shaw,
A. M. Sumner,
C. W. Swan,
G. G. Tarbell,
W. G. Wheeler,
H. W. Williams.

Worcester.
G. E. Francis,
E. B. Harvey,
D. W. Hodgkins,
W. E. Rice,
E. Warner,
J. O. West.

Worcester North.
R. F. Andrews,
Ira Russell.

Total, 79.

The record of the previous meeting was read and accepted.

The Committee on Membership and Resignations reported through Dr. Ayer. In accordance with their recommendation the following were allowed to resign:

Drs. Homer S. Bell, of Granby.
Harry C. Coe, of Detroit, Mich.
Arthur H. Kimball, of Battle Creek, Mich.

Also, the following was allowed to retire:

Dr. Willard W. Codman, of Boston.

Also, the following, having forfeited their membership by removal from the State and failure to pay assessments, were dropped from the roll:

Drs. Horace Berry, of New Orleans, La.
James N. Dickson, of Poquonock, Conn.
James R. Fairbanks, of Amsterdam, N. Y.
Horace Chapin, of Lincoln, Neb.
William Davis, of Syracuse, N. Y.
Charles A. Goldsmith, of Portland, Me.
David Mack, of Vienna, Va.
Philip M. Ryan, of Montreal, Can.
William B. Sawyer, of Omaha, Neb.
William F. Southard, of Vulture, Ariz.
John Stearns, of Montreal, Can.
Frank W. Ring, of New York, N. Y.

Dr. E. H. Bradford, for the Committee appointed at the last meeting to consider the petition from the general Censors' meeting regarding special meetings of Censors, reported that

The committee find in the Revised Statutes Massachusetts, Part I., Chap. XXII., Sect. 3, the following:—

"The meetings of the Censors shall be held in those districts respectively, in such places and at such stated periods as the Councillors of the Society may direct."

Also, in the By-Laws of the Society, 1881, XX., l. 8:—

"The Censors shall meet as hereinafter designated, or at such times as the Councillors may direct."

Also in the Digest of the Acts of the Commonwealth relating to the Mass. Med. Society, XIX.:—

"The Censors elected by the District Societies for the purpose of examining candidates shall, at least three of them, be convened in Boston on the Thursday next preceding the annual meeting of the general society, and at such other times and places as the By-Laws shall direct."

The committee find no prohibition of special meetings other than those designated, but such meetings would be manifestly informal or illegal, as authority is granted to no one to call such meetings, and the chairman of a board of censors who should summon the Board at other times than those designated would be in the position of a speaker of the House who should, on his own responsibility, attempt to convene the House at an irregular time. This, however, does not prevent special meetings of the individual Censors to consult as often as they may deem fitting, such meetings being analogous to conferences or meetings of committees, and not official or for the transaction of official business.

The committee further do not find that it is advisable to ask the Councillors to appoint other times for the stated meetings than those already specified; for in By-law XX., lines 25–27, it is expressly stated as follows:—

"Any meeting of Censors, whether a quorum be present or not, may be continued by adjourment to such time and place within the district as may be determined upon by the Censors present."

If, therefore, the stated meetings as prescribed are insufficient in number, or occur at such times as may not be for the best interest of the District Society, it is within the power of the Censors of said Society to adjourn to such a time and as frequently as they may deem necessary. Meetings at

irregular times, to accommodate individuals, are liable to cause confusion and are not advisable.

Further legislation on the subject seems, therefore, unnecessary.

Voted,—To accept the above report.

Voted,—That Dr. Charles Lyman Hubbell, of Williamstown, be restored to fellowship.

Adjourned at 11.40, A.M.

FRANCIS W. GOSS,
Recording Secretary.

February 6, 1884.

A Stated Meeting of the Councillors was held in the hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Wednesday, February 6, 1884, at 11 o'clock, A.M.

The President, Dr. Alfred Hosmer, in the chair.

The following Councillors were present:

Berkshire.
O. J. Brown.

Bristol North.
S. D. Presbrey.

Bristol South.
G. Atwood,
F. H. Hooper,
F. A. Sawyer,
J. J. B. Vermyne.

Essex North.
C. G. Carleton.

Essex South.
D. Coggin,
H. Colman,
W. W. Eaton,
J. S. Emerson,
A. H. Johnson,
C. A. Lovejoy,
H. R. Stedman.

Hampshire.
D. B. N. Fish.

Middlesex East.
A. H. Cowdrey,
J. M. Harlow,
F. Winsor.

Middlesex North.
L. S. Fox,
L. Howard,
F. Nickerson,
G. E. Pinkham.

Middlesex South.
R. A. Blood,
T. Crozier,
J. G. Dearborn,
J. B. Everett,
S. Hanscom,
A. Hosmer,
C. E. Spring,
G. J. Townsend,
C. E. Vaughan,
A. C. Webber,
R. Willis.

Norfolk.
H. P. Bowditch,
G. A. Bragdon,
T. T. Cushman,
J. A. Gordon,
J. S. Greene,
C. C. Hayes,
I. H. Hazelton,
A. R. Holmes,
C. C. Tower.

Plymouth.
H. W. Dudley,
J. C. Gleason,
Asa Millet,
A. E. Paine.

Suffolk.
S. L. Abbot,
J. Ayer,
H. H. A. Beach,
C. J. Blake,
H. I. Bowditch,
H. Curtis,
O. W. Doe,
F. W. Draper,
R. H. Fitz,
C. F. Folsom,
J. O. Green,
S. A. Green,
W. H. H. Hastings,
R. M. Hodges,
J. Homans,
B. J. Jeffries,
F. I. Knight,
S. W. Langmaid,
G. H. Lyman,
C. B. Porter,
W. L. Richardson,
G. C. Shattuck,
B. S. Shaw,
A. D. Sinclair,
A. M. Sumner,
C. W. Swan,
G. G. Tarbell,
J. C. Warren,
W. G. Wheeler,
E. N. Whittier,
H. W. Williams.

Worcester.
G. Brown,
G. E. Francis,
E. B. Harvey,
E. Warner,
G. C. Webber,
J. O. West,
L. Wheeler.

Worcester North.
G. Jewett,
Ira Russell.

Total, 86.

The record of the last meeting was read and accepted.

The following Committees were appointed:

To Audit the Treasurer's Accounts.—Drs. C. C. Tower, J. O. Marble.

To Examine the Library.—Drs. O. W. Doe, Z. B. Adams.

To Examine the By-Laws of District Societies.—Drs. S. D. Presbrey, J. C. White, F. W. Chapin.

The Committee on Membership and Resignations recommended, and it was voted, that the following be allowed to retire:

Drs. Jonas C. Harris, of Arlington.
William C. Breck, of Springfield.

Adjourned at 12.00, M.

FRANCIS W. GOSS,
Recording Secretary.

Annual Meeting.

The Annual Meeting of the Councillors was held in the hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Tuesday, June 10, 1884, at 7 o'clock, P.M.

The President, Dr. Alfred Hosmer, in the chair.

The following Councillors were present:

Barnstable.
C. M. Hulbert.

Berkshire.
C. W. Burton,
W. W. Leavitt,
H. J. Millard.

Bristol North.
J. R. Bronson,
S. D. Presbrey.

Bristol South.
J. Dwelly,
F. H. Hooper,
J. H. Mackie,
F. A. Sawyer,
J. J. B. Vermyne.

Essex North.
O. D. Cheney,
D. Dana.

Essex South.
H. Colman,
W. W. Eaton,
J. S. Emerson,
J. Gârland,
T. Kittredge,
C. A. Lovejoy,
S. W. Torrey.

Franklin.
C. M. Duncan.

Hampden.
G. E. Fuller.

Hampshire.
J. Yale.

Middlesex East.
S. W. Kelley,
F. Winsor.

Middlesex North.
F. Nickerson,
M. G. Parker,
G. E. Pinkham.

Middlesex South.
A. P. Clarke,
E. Cowles,
E. R. Cutler,
C. K. Cutter,
J. A. Dow,
W. W. Dow,
H. M. Field,
J. L. Hildreth,
R. L. Hodgdon,
H. E. Marion,
G. C. Pierce,
E. H. Stevens,
L. R. Stone,
J. L. Sullivan,
G. J. Townsend,
A. C. Webber,
H. C. White,
J. W. Willis,
M. Wyman.

Norfolk.
H. P. Bowditch,
G. A. Bragdon,
T. T. Cushman,
J. A. Gordon,
J. S. Greene,
C. C. Hayes,
J. G. S. Hitchcock,
I. H. Hazelton,
H. T. Mansfield,
J. Seaverns,
C. C. Tower,
D. B. Van Slyck.
E. T. Williams,
J. A. Winkler.

Plymouth.
H. W. Dudley,
J. C. Gleason,
B. F. Hastings,
A. E. Paine,
W. Peirce.

Suffolk.
S. L. Abbot,
J. Ayer,
H. I. Bowditch,
S. Cabot,
D. W. Cheever,
H. Derby,
O. W. Doe,
F. W. Draper,
J. R. Draper,
T. Dwight,
C. F. Folsom,

J. O. Green,
S. A. Green,
F. B. Greenough,
W. H. H. Hastings,
R. M. Hodges,
C. D. Homans,
J. Homans,
W. Ingalls,
B. J. Jeffries,
F. I. Knight,
S. W. Langmaid,
F. Minot,
C. B. Porter,
J. P. Reynolds,
W. L. Richardson,
G. C. Shattuck,
B. S. Shaw,
A. D. Sinclair,
A. M. Sumner,
C. W. Swan,
G. G. Tarbell,
W. H. Thorndike,
O. F. Wadsworth,
J. C. Warren,
T. Waterman,
W. G. Wheeler,
J. C. White.

Worcester.

A. G. Blodgett,
W. Davis,
T. H. Gage,
E. B. Harvey,
G. M. Morse,
J. G. Park,
W. E. Rice,
G. C. Webber,
L. Wheeler,
A. Wood.

Worcester North.

R. F. Andrews,
J. P. Lynde,
Ira Russell.

Total, 117.

The record of the previous meeting was read and accepted.

The Secretary read the names of new and of deceased Fellows.

The Treasurer, Dr. Draper, read his annual report.

The Auditing Committee reported that they found the accounts properly vouched and correctly cast; also that they examined the evidences of the Society's invested funds and found them to correspond with the schedule exhibited.

The Treasurer's report was then accepted.

The Committee on Finances reported through Dr. Homans, and recommended that $1328.43, being eighty-five per cent. of the balance remaining in the treasury, be distributed among the District Societies. Adopted.

The Committee on Membership and Resignations reported through Dr. Ayer. In accordance with their recommendation it was voted that the following be allowed to retire:

Drs. John Barns, of Milford.
Henry Cowles, of Saxonville.
Joseph Hagar, of East Marshfield.
David T. Huckins, of Watertown.
George S. Jones, of Boston.
Horatio G. Morse, of Roxbury.
James M. Stickney, of Pepperell.

Also, that the following be allowed to resign:

Drs. Sanger Brown, of New York, N. Y.
Ruggles A. Cushman, of Sublette, Ill.
Donald Darrach, of Kensington, P. E. I.
George H. Felton, of St. Paul, Minn.
William C. Mason, of Bangor, Me.
W. Thornton Parker, U. S. Army.
Whitmell P. Small, of Washington, N. C.
James Waldock, of Roxbury.
Henry A. Wood, of Detroit, Mich.

Also, that the following be dropped from the roll:

Drs. E. P. Morong, of Boston.
T. H. Pryor, of Boston.
A. S. M. Chisholm, of Valparaiso, Chili.
J. L. Maloney, of Madeira, Cal.
A. W. Parsons, of Brainerd, Minn.
Horace Richardson.

The Committee on By-Laws of the District Societies reported through Dr. Presbrey. The report stated that some of the District Societies have by their By-Laws " Committees on Ethics." In the opinion of the Committee, inasmuch as a District Society has nothing to do with Ethics and Discipline, such a Committee is superfluous and ought not to exist.

Voted,—To accept the above report.

Voted,—That Dr. Moses Reuben Greeley, of South Weymouth, be restored to membership in the Society.

The Committee on Nominations, through Dr. Shattuck, reported a list of candidates for the offices of the Society for the ensuing year, and the same were elected by ballot:

President . .	Dr. Charles D. Homans, of Boston.
Vice President . .	Dr. Adam C. Deane, of Greenfield.
Treasurer . .	Dr. Frank W. Draper, of Boston.
Corresponding Secretary	Dr. Charles W. Swan, of Boston.
Recording Secretary .	Dr. Francis W. Goss, of Roxbury.
Librarian . .	Dr. Edwin H. Brigham, of Boston.

Dr. Franklin K. Paddock, of Pittsfield, was chosen Orator, and

Dr. ROBERT AMORY, of Boston, Anniversary Chairman, for the next Annual Meeting.

The President introduced the President-elect, Dr. HOMANS, who made a fitting response.

Voted,—That the next Annual Meeting be held in Boston, on the second Wednesday in June, 1885.

On nomination by the President, the following Standing Committees were appointed.

Of Arrangements.

C. E. Wing, H. C. Haven, J. W. Elliot,
A. T. Cabot, C. H. Williams, Frank H. Hooper.

On Publications.

G. C. Shattuck, R. M. Hodges, B. E. Cotting.

On Membership and Resignations.

J. Ayer, F. Minot, D. W. Cheever.

On Finances.

W. W. Wellington, B. S. Shaw, E. G. Cutler.

To Procure Scientific Papers.

C. W. Swan, G. S. Stebbins, J. R. Chadwick,
R. H. Fitz, H. P. Walcott.

On Ethics and Discipline.

G. J. Townsend, G. E. Francis, A. H. Johnson,
C. Howe, F. C. Shattuck.

On Medical Diplomas.

W. L. Richardson, A. H. Cowdrey, E. J. Forster.

After discussion the following was passed, 63 to 47:

Voted,—That the first four lines of By-Law I. be stricken out, and the following be put in their place, viz.:—

Candidates for admission into the Massachusetts Medical Society may be either male or female; and every candidate must, by proper credentials and examination, satisfy the Censors of said Society that he possesses the following qualifications for fellowship:

Adjourned at 9.20, P.M.

FRANCIS W. GOSS,
Recording Secretary.

Massachusetts Medical Society.

PROCEEDINGS OF THE SOCIETY.

ADJOURNED MEETING.

JUNE 10, 1884.

The Society met, pursuant to adjournment, at 4 o'clock, P.M., on Tuesday, June 10, 1884, in Huntington Hall, Institute of Technology, Boston.

The President, Dr. ALFRED HOSMER, in the chair.

The Secretary read the portion of the record of the last annual meeting pertaining to this adjourned meeting.

The chair called attention to the fact that the Code of Ethics adopted by the Councillors, Feb. 4, 1880, has never been acted upon by the Society, and that it needs the concurrent vote of the latter to make it of binding effect.

Voted,—That the Society adopt the Code in question as the Code of Ethics of the Massachusetts Medical Society.

Voted,—That a Committee of one from each of the District Societies be appointed by the President, which committee shall be authorized to advise, and secure, if possible, from the State Legislature, an enactment to protect the people from ignorant and incompetent practitioners of medicine.

Dr. Bowditch offered the following amendment to the By-Laws:—

Voted,—That the first four lines of By-Law I. be stricken out, and the following be put in their place, viz.:—

Candidates for admission into the Massachusetts Medical Society may be either male or female; and every candidate must, by proper credentials and examination, satisfy the Cen-

sors of said Society that he possesses the following qualifications for fellowship:

After discussion the above was carried by a vote of 209 in the affirmative to 123 in the negative.

Adjourned at 5.20, P.M.

FRANCIS W. GOSS,
Recording Secretary.

ANNUAL MEETING.

FIRST DAY.

The Society met in the Harvard Medical School Building, Boston, on Tuesday, June 10, 1884, at 12 o'clock, M.

The President, Dr. ALFRED HOSMER, in the chair.

The following communications were presented:

1. METHODS OF INSTRUCTION AND RESEARCH IN PHYSIOLOGY, WITH DEMONSTRATIONS.—By Professor H. P. Bowditch.
2. MODERN METHODS IN ANATOMY, WITH DEMONSTRATIONS.—By Professor Thomas Dwight.

Adjourned at 2 o'clock, P.M.

The Society reassembled at 3 o'clock, P.M., in Huntington Hall, Institute of Technology, Boston.

The Vice President, Dr. IRA RUSSELL, in the chair.

The following paper was read:

3. THE PLASTER-POSTERIOR SPLINT IN THE TREATMENT OF FRACTURES OF THE LEG, WITH ITS PRACTICAL APPLICATION.—By G. W. Gay, M.D., of Boston.

Adjourned at 4 o'clock, P.M.

At 5.30, P.M., by invitation of the Medical Faculty of Harvard University, the Society visited the new Medical College. The building was exhibited and a collation was served.

FRANCIS W. GOSS,
Recording Secretary.

Second Day.

The Society met in Huntington Hall, Boston, on Wednesday, June 11, 1884, at 9 o'clock, A.M., for the exercises of the one hundred and third Anniversary.

The President, Dr. Alfred Hosmer, in the chair.

The records of the last annual meeting and of the adjourned meeting were read and accepted.

The Secretary read the names of Fellows admitted since the last annual meeting, and of Fellows whose deaths had been reported.

Fellows admitted since June 12, 1883.

1884	Adams, Herbert William	Dorchester.
1884	Allen, Bradford	Brockton.
1883	Allen, Louis Edmund	Boston.
1883	Atwood, Charles Augustus	Taunton.
1883	Bagg, John Sullivan	Springfield.
1884	Barstow, Henry Taylor	Boston.
1884	Baxter, Edward Hooker	Hyde Park.
1884	Bell, Robert Eddy	Lowell.
1883	Bigelow, Enos Hoyt	Framingham.
1883	Birge, William Spafard	Truro.
1883	Bradley, Charles Seymour	Westboro'.
1884	Brainerd, John Bliss	Boston.
1884	Burdick, Allen	Roxbury.
1884	Buzzell, Daniel Thompson	Dorchester.
1883	Canfield, Ralph Metcalfe	Attleboro'.
1884	Chase, George Thorndike	Boston.
1883	Cole, Ralph Marcus	Tewksbury.
1883	Collins, Edgar Clarence	Hinsdale.
1883	Conant, William Merritt	Boston.
1883	Cone, Dwight Eleazer	Fall River.
1883	Couch, Joseph Daniel	East Boston.
1884	Cutter, William Pool	Gardner.
1884	Daniels, Frank Herbert	Boston.
1883	Daniels, Frederick Henry	Worcester.
1883	Darling, Cassius Harriot	Worcester.
1884	Davis, Silas Wright	Winchester.
1884	Delahanty, William Joseph	Worcester.
1884	Devine, William Henry	South Boston.
1884	Donoghue, Daniel Francis	Holyoke.

1883	Downing, Alfred Clark . .	Palmer.
1883	Dyer, Anderson Dana . . .	Jamaica Plain.
1884	Eames, George Frank . . .	Boston.
1884	Finnigan, Patrick Joseph . .	East Cambridge.
1883	Foskett, George Mason . .	North Dana.
1884	Foster, Charles Chauncy . .	Cambridge.
1883	Friend, Walter Morrison . .	Roxbury.
1883	Gibbs, Locero Jackson . .	Chicopee Falls.
1884	Harriman, Herbert James . .	Boston.
1883	Heath, Joseph Webster . .	Wakefield.
1884	Heustis, James Walter . .	Boston.
1883	Holyoke, Frank	Holyoke.
1883	Hubbard, Frank Allen . .	Taunton.
1883	Huse, George Wood . . .	Quincy.
1883	Jack, Frederick La Fayette . .	Boston.
1883	Jenkins, Charles Edwin . .	Lynn.
1884	Johnson, Francis Emerson . .	Lawrence.
1883	Johnson, Frank Mackie . .	Boston.
1884	Kelley, George Wallace . .	Barnstable.
1884	Kelley, Horatio Sprague, Jr. .	Dennisport.
1884	Kelley, Joseph Henry . . .	Worcester.
1884	Kelly, James Edward . . .	Boston.
1883	Kemble, Lawrence Grafton . .	Salem.
1884	Kenney, John Erle . . .	Taunton.
1883	Kenyon, Henry Jesse . . .	Lawrence.
1884	Kielty, John Daniel . . .	Fitchburg.
1884	Kilburn, Henry Whitman . .	Boston.
1884	King, Calvin Bryant . . .	Belchertown.
1884	Knowles, William Fletcher . .	Boston.
1884	Litchfield, William Harvey . .	Hull.
1884	Mackenzie, Freeman Alexander .	South Boston.
1883	Martin, Francis Coffin . . .	Roxbury.
1884	Mason, Atherton Perry . .	Fitchburg.
1884	McDonald, Rufus Cyrene . .	Chelsea.
1883	Mead, Julian Augustus . .	Watertown.
1884	Millerick, Daniel Edward . .	Boston.
1884	Mooney, Philip	Gloucester.
1884	Nickerson, George Wheaton .	Stoneham.
1883	Parker, Charles Frederick . .	Boston.
1884	Pierce, Arthur Clarence . .	Dighton.
1884	Preble, Wallace	Roxbury.
1883	Race, Gorton Herbert. . .	W. Stockbridge.
1883	Ripley, Frederick Jerome . .	Brockton.
1883	Rogers, Frank Alvin . . .	Brewster.
1883	Scofield, Columbus Sewell . .	Boston.
1884	Seelye, Hiram Henry . .	Amherst.
1884	Sheldon, Preston	Wakefield.

1883	Smith, Ashbury Gilbert . .	South Boston.
1883	Smith, Sumner Phinney . .	Lowell.
1884	Smith, Walter Anson . . .	Cummington.
1884	Sparhawk, Clement Willis . .	Boston.
1883	Stephenson, Franklin Bache .	U. S. Navy.
1883	Stevens, William Caldwell . .	Worcester.
1883	Stevens, William Stanford . .	Boston.
1884	Stickney, George Augustus .	Beverly.
1883	Sullivan, James Edmund . .	Fall River.
1883	Tuckerman, Frederick . .	Amherst.
1884	Underwood, George Baker . .	West Gardner.
1883	Warren, Charles Everett . .	Boston.
1884	Weil, Frank Edward . . .	North Andover.
1883	Wells, James Lee . . .	Boston.
1884	Wheatley, Frank George . .	North Abington.
1884	Wheeler, Charles Salter . .	Williamsburg.
1883	Wheeler, Edward Reed . .	Spencer.
1884	Whitcombe, Charles Reed . .	Roslindale.
1883	Willey, George Arthur . .	Florence.
1883	Woodbury, George Franklin .	Worcester.
1883	Worcester, Alfred . . .	Waltham.

Total, 97.

List of Deceased Fellows.

Admitted.	Name.	Residence.	Date of Death.	Age.
1861	ALLEN, ALMON NELSON	Pittsfield.......	Feb. 6, 1884	63
1861	ARNOLD, GEORGE JEROME....	Roxbury........	Oct. 3, 1883	48
1865	CAMPBELL, WILLIAM HENRY.	Roxbury........	April 24,1884	52
1873	DRESSER, SIMEON PARKER...	Hinsdale........	Nov. 15, 1883	40
1874	EASTMAN, ALBERT FAXON....	Abington	Feb. 13, 1884	41
1850	ELLIS, CALVIN..............	Boston..........	Dec. 14, 1883	57
1868	FAY, JOSEPH ALLEN.........	Milford	Nov. 7, 1883	39
1878	FITZ, SAMUEL EATON........	Roxbury........	Oct. 20, 1883	47
1874	FLEMING, JAMES ALOYSIUS...	Boston..........	Sept. 30, 1883	30
1875	FOWLER, EDGAR OMEARA....	Danvers.........	May 1, 1884	31
1835	HAMILTON, ERASMUS DARWIN	Conway	July 18, 1883	71
1853	HILDRETH, CHARLES HOSEA..	Gloucester	May 18, 1884	58
1821	HOOKER, GEORGE...........	Longmeadow...	Mar. 14, 1884	90
1840	JOHNSON, JOSHUA JEWETT....	Northboro'.....	Jan. 29, 1884	74
1867	JOYCE, ROBERT DWYER......	Boston	Oct. 23, 1883	51
1861	KEMP, ALBA ENOCH.........	East Douglas...	Oct. 29, 1883	61
1851	LAWRENCE, GEORGE CARLISLE	North Adams...	Jan. 6, 1884	63
1862	LORD, FRIEND DRAKE.......	Newton L. Falls.	Dec. 8, 1883	62
1872	MEAD, EDWARD..............	Roxbury........	June 28, 1883	64
1866	MEAD, MARSHALL SPRING...	Northfield......	Nov. 12, 1883	81
1826	PARKER, HENRY............	Capron Sp. W.V.	June 1, 1878	92
1877	*PARKER, WILLARD.........	New York, N.Y.	April 25,1884	83
1841	PHINNEY, ERASTUS OTIS.....	Melrose.........	July 8, 1883	73
1854	PICKETT, NOBLE BENNETT...	Housatonic.....	Feb. 5, 1884	83
1839	PRATT, JEFFERSON..........	Hopkinton.....	June 26, 1883	80
1863	ROBERTS, MICHAEL.........	Lawrence	Feb. 10, 1884	56
1837	SABIN, HENRY LYMAN.......	Williamstown ..	Feb. 24, 1884	82
1837	SABIN, MELLEN.............	Aurora, Ill.....		
1876	SANBORN, WILBUR FISKE....	N.Sandwich,NH	Mar. 19, 1884	34
1863	SPOFFORD, MORRIS..........	Groveland	March 7, 1884	54
1855	TUCKER, GEORGE GRENVILLE.	Westfield	Aug. 20, 1883	49
1846	WAKEFIELD, HORACE POOLE.	Leicester.......	Aug. 23, 1883	74

* Honorary. Total, 32.

The Treasurer, Dr. Draper, read his annual report.

Papers were read as follows:

4. A CASE OF CHYLOUS DEPOSIT IN THE ABDOMEN.—By F. Nickerson, M.D., of Lowell.
5. THE PITCH OF THE PERCUSSION SOUND.—By L. Huntress, M.D., of Lowell.
6. SANITARY FOREST-CULTURE.—By J. F. A. Adams, M.D., of Pittsfield.

After discussion it was

Voted,—That the subject of Tree Forestry be referred to the Legislative Committee appointed at the adjourned meeting of the Society held yesterday, and that Dr. Adams, of Pittsfield, be added to the Committee.

7. WEIGHT AS AN INDICATION OF THE CHARACTER OF RISKS FOR LIFE INSURANCE.—By J. Seaverns, M.D., of Roxbury.
8. A Report from the Middlesex North District Medical Society on THE GENERAL HEALTH OF LOWELL AND ITS VICINITY.—By W. H. Lothrop, M.D., of Lowell.

The following Delegates from other State Medical Societies were introduced and made brief responses:

Vermont.—Dr. E. A. Pond.
Rhode Island.—Dr. C. O'Leary.
Connecticut.—Dr. C. M. Carleton.
New York.—Dr. G. G. Hopkins.
New Jersey.—Dr. E. North.

At 12 o'clock the Annual Discourse was delivered by Dr. JOHN CROWELL, of Haverhill.

At the close of the oration a vote of thanks was presented to the orator for his very able and interesting address.

The President introduced the President-elect, Dr. CHARLES D. HOMANS, of Boston.

At 1, P.M., the Society adjourned to the Winslow Skating Rink, where the eighty-third annual dinner, presided over by the Anniversary Chairman, Dr. GEORGE B. SHATTUCK, was served to seven hundred Fellows.

FRANCIS W. GOSS,
Recording Secretary.

TREASURER'S REPORT.

THE following report of the Society's finances for the year ending April 15, 1884, is respectfully submitted.

Including a balance of $1539.42 from the previous year's accounts, the receipts were $9,503.17; the disbursements amounted to $7,940.31; and the balance to be carried to the new year's credit is $1,562.86. The various sources of revenue and the items of expenditure are presented in the accompanying analysis-account.

The invested funds of the Society are the same as at the last report; they amount to $32,420.17.

The dues of delinquent Fellows whose cases were found to be worthy of indulgence were remitted to the amount of $100.00, by vote of the Councillors, upon recommendation of the Finance Committee.

In accordance with the instructions of the Council, back dues to the amount of $30.00 were collected by process of law.

The names of twelve Fellows, who had removed from the State, have been dropped from the roll, because the annual assessments remained unpaid for several years.

The Society now bears upon its catalogue the names of 1525 members.

F. W. DRAPER,
Treasurer.

BOSTON, June 1, 1884.

The undersigned, a Committee appointed to examine the accounts of the Treasurer, have attended to that duty, and have the honor to report that they find them properly vouched and correctly cast; also that they have examined the evidences of the Society's invested funds, and find them to correspond with the schedule exhibited.

C. C. TOWER, } *Auditing*
J. O. MARBLE, } *Committee.*

Dr. **F. W. Draper, Treasurer, in Account with**

Income.

Balance from last account		$1539 42
Assessments paid to the Treasurer		1115 00
Assessments collected by the District Treasurers:—		
Barnstable	$90 00	
Berkshire	145 00	
Bristol North	145 00	
Bristol South	105 00	
Essex North	325 00	
Essex South	360 00	
Franklin	110 00	
Hampden	270 00	
Hampshire	175 00	
Middlesex East	80 00	
Middlesex North	332 50	
Middlesex South	365 00	
Norfolk	580 00	
Plymouth	150 00	
Suffolk	1590 00	
Worcester	520 00	
Worcester North	150 00	
		5492 50
Interest account:—		
General Fund ($11,253.30)	450 12	
Shattuck Fund ($9,166.87)	366 67	
Phillips Fund ($10,000.00)	400 00	
Cotting Fund ($2,000.00)	75 00	
Interest on cash deposited with New England Trust Co.	59 46	
		1351 25
Sale of Diploma		5 00
		$9503 17

Expense.

On account of Annual Meeting, 1883:—		
Caterer's bill	$1272 50	
Cigars	96 30	
Expenses of Sanitary Exhibition	164 65	
Incidentals	32 08	
Music	106 00	
Printing	22 25	
Rent of Skating Rink	125 00	
		1818 78
Ethics and Discipline:—		
Mileage of Committee		39 00
Committee on Publications:—		
Braithwaite's Retrospect	2185 00	
Printing Annual Publications, 1883	460 12	
		2645 12
Councillors' Orders:—		
Lunches at Stated Meetings (paid by Cotting Fund)	110 00	
Payment of "Clough Prizes"	100 00	
		210 00
District Societies' Account:—		
Censors' fees	276 00	
Dividend, 1883	1308 50	
Printing and Stationery for Censors at large	6 50	
Advertising Meetings of Censors at large	7 00	
District Treasurer's fees and expenses	318 19	
		1916 19
Librarian's Expenses:—		
Postage	274 74	
Salary of Clerk	50 00	
Stationery	11 85	
		336 59
Recording Secretary's Expenses:—		
Incidentals	1 00	
Postage	55 65	
Printing	31 00	
Salary	250 00	
Stationery	75	
		338 40
Rent to March 1, 1884		175 00
Treasurer's Expenses:—		
Incidentals	1 75	
Postage and printing	43 58	
Salary	400 00	
Stationery	15 90	
		461 23
		7940 31
Balance to new account		1562 86
		$9503 17

Officers of the Massachusetts Medical Society.

1884–85.

CHOSEN JUNE 10, 1884.

CHARLES D. HOMANS,	Boston, . .	PRESIDENT.
ADAM C. DEANE, . .	Greenfield, .	VICE-PRESIDENT.
FRANK W. DRAPER, .	Boston, . .	TREASURER.
CHARLES W. SWAN, .	Boston, . .	COR. SECRETARY.
FRANCIS W. GOSS, .	Roxbury, .	REC. SECRETARY.
EDWIN H. BRIGHAM, .	Boston, . .	LIBRARIAN.
FRANKLIN K. PADDOCK,	Pittsfield, .	ORATOR.
ROBERT AMORY, . .	Boston, . .	ANNIV. CHAIRMAN.

Standing Committees.

Of Arrangements.

C. E. WING, C. H. WILLIAMS,
A. T. CABOT, J. W. ELLIOT,
H. C. HAVEN, F. H. HOOPER.

On Publications.

G. C. SHATTUCK, R. M. HODGES, B. E. COTTING.

On Membership and Resignations.

J. AYER, F. MINOT, D. W. CHEEVER.

On Finances.

W. W. WELLINGTON, B. S. SHAW, E. G. CUTLER.

To Procure Scientific Papers.

C. W. SWAN, G. S. STEBBINS, J. R. CHADWICK,
R. H. FITZ, H. P. WALCOTT.

On Ethics and Discipline.

G. J. TOWNSEND, G. E. FRANCIS, A. H. JOHNSON,
C. HOWE, F. C. SHATTUCK.

On Medical Diplomas.

W. L. RICHARDSON, A. H. COWDREY, E. J. FORSTER.

Presidents of District Societies—Vice-Presidents (Ex-Officiis).

(Arranged according to Seniority.)

F. Collamore,	J. A. Douglass,
J. H. Streeter,	J. F. A. Adams,
W. Lester,	A. Wood,
Z. B. Adams,	G. S. Stebbins,
F. A. Sawyer,	E. C. Coy,
J. C. White,	C. C. Pike,
J. O. Dow,	J. P. Brown,
R. F. Andrews,	J. E. Pratt.
W. Bass,	

Councillors.

Barnstable.—Drs. T. R. Clement, Centreville; C. M. Hulbert, South Dennis; F. W. Pierce, Marston's Mills.

Berkshire.—Drs. O. J. Brown, North Adams; C. W. Burton, Adams; W. W. Leavitt, West Stockbridge; H. J. Millard, North Adams; L. Miller, Stockbridge.

Bristol North.—Drs. J. R. Bronson, Attleboro'; J. Murphy, N. Paige, S. D. Presbrey, Taunton.

Bristol South.—Drs. G. Atwood, Fairhaven; J. Dwelly, Fall River; F. H. Hooper, J. H. Mackie, New Bedford; F. A. Sawyer, Wareham; J. J. B. Vermyne, New Bedford.

Essex North.—Drs. C. N. Chamberlain, Lawrence; O. D. Cheney, Haverhill; W. Cogswell, Bradford; D. Dana, Lawrence; F. A. Howe, Newburyport; O. T. Howe, Lawrence; J. Pierce, Methuen; J. C. Pennington, Andover.

Essex South.—Drs. H. Colman, Lynn; W. W. Eaton, Danvers; J. S. Emerson, Lynn; J. Garland, Gloucester; W. A. Gorton, Danvers; A. H. Johnson, A. Kemble, T. Kittredge, Salem; C. A. Lovejoy, Lynn; G. S. Osborne, Peabody; S. W. Torrey, Beverly.

Franklin.—Drs. F. J. Canedy, Shelburne Falls; A. C. Deane, *Vice President*, Greenfield; C. M. Duncan, Shelburne.

Hampden.—Drs. T. F. Breck, Springfield; G. E. Fuller, Monson; W. Holbrook, Palmer; G. C. McClean, Springfield; M. M. Mitivier, Holyoke; V. L. Owen, G. L. Woods, Springfield.

HAMPSHIRE.—Drs. F. Bonney, Hadley; C. W. Cooper, J. Dunlap, Northampton; F. C. Greene, Easthampton; J. Yale, Ware.

MIDDLESEX EAST.—Drs. A. H. Cowdrey, Stoneham; J. W. Kelley, Woburn; F. Winsor, Winchester.

MIDDLESEX NORTH.—Drs. C. Dutton, Tyngsboro'; C. M. Fisk, Lowell; S. W. Fletcher, Pepperell; L. Howard, Chelmsford; F. Nickerson, M. G. Parker, G. E. Pinkham, F. C. Plunkett, H. J. Smith, Lowell.

MIDDLESEX SOUTH.—Drs. A. P. Clarke, Cambridgeport; E. Cowles, Somerville; E. R. Cutler, Waltham; C. K. Cutter, Charlestown; J. A. Dow, Cambridgeport; W. W. Dow, Somerville; H. M. Field, Newton; J. L. Hildreth, Cambridge; R. L. Hodgdon, Arlington; H. E. Marion, Brighton; G. C. Pierce, Ashland; E. H. Stevens, North Cambridge; L. R. Stone, Newton; J. L. Sullivan, Malden; G. J. Townsend, South Natick; C. E. Vaughan, Cambridge; A. C. Webber, Cambridgeport; H. C. White, East Somerville; J. W. Willis, Waltham; M. Wyman, Cambridge.

NORFOLK.—Drs. H. P. Bowditch, Jamaica Plain; G. A. Bragdon, Dorchester; T. T. Cushman, Randolph; J. A. Gordon, Quincy; J. S. Greene, Dorchester; C. C. Hayes, Hyde Park; I. H. Hazelton, Grantville; J. G. S. Hitchcock, Foxboro'; H. T. Mansfield, Needham; J. H. Richardson, Medfield; J. Seaverns, Roxbury; C. C. Tower, South Weymouth; D. B. Van Slyck, Brookline; E. T. Williams, Roxbury; J. A. Winkler, Jamaica Plain.

PLYMOUTH.—Drs. H. W. Dudley, Abington; J. C. Gleason, Rockland; B. F. Hastings, South Abington; A. E. Paine, Brockton; W. Peirce, Plymouth.

SUFFOLK.—Drs. S. L. Abbot, J. Ayer, H. H. A. Beach, H. J. Bigelow, C. J. Blake, J. G. Blake, H. I. Bowditch, S. Cabot, D. W. Cheever, H. Curtis, H. Derby, O. W. Doe, F. W. Draper, *Treasurer*, J. R. Draper, T. Dwight, R. H. Fitz, C. F. Folsom, J. O. Green, S. A. Green, F. B. Greenough, W. H. H. Hastings, R. M. Hodges, C. D. Homans, *President*, J. Homans, W. Ingalls, B. J. Jeffries, F. I. Knight, S. W. Langmaid, G. H. Lyman, F. Minot, C. B. Porter, J. P. Rey-

nolds, W. L. Richardson, G. C. Shattuck, B. S. Shaw, A. D. Sinclair, D. H. Storer, A. M. Sumner, C. W. Swan, *Corresponding Secretary*, G. G. Tarbell, W. H. Thorndike, O. F. Wadsworth, J. C. Warren, T. Waterman, Boston; W. G. Wheeler, Chelsea; J. C. White, E. N. Whittier, H. W. Williams, Boston.

WORCESTER.—Drs. A. G. Blodgett, West Brookfield; G. Brown, Barre; W. Davis, G. E. Francis, T. H. Gage, Worcester; E. B. Harvey, Westboro'; G. M. Morse, Clinton; J. G. Park, J. M. Rice, Worcester; W. E. Rice, New England Village; E. Warner, Worcester; G. C. Webber, Millbury; J. O. West, Princeton; L. Wheeler, A. Wood, Worcester.

WORCESTER NORTH.—Drs. R. F. Andrews, Gardner; B. H. Hartwell, Ayer; G. Jewett, Fitchburg; J. P. Lynde, Athol; I. Russell, Winchendon.

Censors.

BARNSTABLE.—Drs. G. W. Doane, Hyannis; B. D. Gifford, Chatham; G. N. Munsell, Harwich; F. W. Pierce, Marston's Mills; W. N. Stone, Wellfleet.

BERKSHIRE.—Drs. H. W. Dewey, F. K. Paddock, Pittsfield; T. Riley, Adams; A. M. Smith, Williamstown; F. P. Whittlesey, Great Barrington.

BRISTOL NORTH.—Drs. C. A. Atwood, M. C. Golden, C. Howe, F. A. Hubbard, W. S. Robinson, Taunton.

BRISTOL SOUTH.—Drs. S. W. Bowen, G. S. Eddy, J. H. Jackson, Fall River; H. S. B. Smith, Middleboro'; J. Q. A. Tourtelot, Fall River.

ESSEX NORTH.—Drs. J. Crowell, Haverhill; F. B. Flanders, Lawrence; R. C. Huse, Georgetown; C. C. Talbot, Lawrence; J. F. Young, Newburyport.

ESSEX SOUTH.—Drs. H. Colman, Lynn; J. P. Fessenden, F. E. Hines, Salem; C. W. Haddock, S. W. Torrey, Beverly.

FRANKLIN.—Drs. E. A. Deane, Montague; J. H. Goddard, Orange; J. Trow, Buckland; R. C. Ward, Northfield; T. Womersley, Greenfield.

HAMPDEN.—Drs. C. D. Brewer, D. Clark, Springfield; F. F. Dole, Chicopee; J. W. Hannum, Ludlow; J. C. Hubbard, Holyoke.

HAMPSHIRE.—Drs. C. W. Cooper, Northampton; J. M. Fay, Haydenville; E. E. Gaylord, Florence; D. Pickard, G. D. Thayer, Northampton.

MIDDLESEX EAST.—Drs. W. S. Brown, Stoneham; J. S. Clark, Melrose; F. W. Graves, Woburn; D. March, Jr., Winchester; C. C. Odlin, Melrose.

MIDDLESEX NORTH.—Drs. F. W. Chadbourne, Lowell; J. B. Heald, Westford; L. Huntress, J. C. Irish, T. P. Shaw, Lowell.

MIDDLESEX SOUTH.—Drs. W. A. Bell, Somerville; C. H. Cook, Natick; D. M. Edgerly, Cambridgeport; E. Farnham, J. T. G. Nichols, Cambridge.

NORFOLK.—Drs. G. W. Clement, E. F. Dunbar, Roxbury; H. C. Ernst, Jamaica Plain; E. L. Farr, J. B. Moran, Roxbury.

PLYMOUTH.—Drs. H. F. Borden, E. A. Chase, Brockton; E. D. Hill, Plymouth; C. S. Millet, Rockland; J. W. Spooner, Hingham.

SUFFOLK.—Drs. A. N. Blodgett, E. G. Cutler, T. M. Rotch, F. C. Shattuck, F. H. Williams, Boston.

WORCESTER.—Drs. W. P. Bowers, Clinton; O. H. Everett, C. A. Peabody, J. B. Rich, Worcester; J. Wilmarth, Upton.

WORCESTER NORTH.—Drs. C. H. Bailey, South Gardner; C. E. Bigelow, Leominster; J. R. Greenleaf, Gardner; J. M. Randall, Leominster; J. W. Stimson, Lunenburg.

Commissioners of Trials.

BARNSTABLE	S. T. Davis	Orleans.
BERKSHIRE	A. M. Smith	Pittsfield.
BRISTOL NORTH	N. Paige	Taunton.
BRISTOL SOUTH	J. B. Whitaker	Fall River.
ESSEX NORTH	F. A. Howe	Newburyport.
ESSEX SOUTH	E. Newhall	Lynn.
FRANKLIN	W. M. Wright	Orange.

Hampden	J. H. Waterman	Westfield.
Hampshire	F. Bonney	Hadley.
Middlesex East	F. F. Brown	Reading.
Middlesex North	N. Allen	Lowell.
Middlesex South	E. J. Forster	Charlestown.
Norfolk	S. E. Stone	Walpole.
Plymouth	W. Peirce	Plymouth.
Suffolk	C. W. Swan	Boston.
Worcester	L. H. Hammond	Worcester.
Worcester North	A. L. Stickney	Ashburnham.

Officers of the District Medical Societies.

Barnstable.—Dr. J. E. Pratt, Sandwich, *President*; Dr. S. T. Davis, Orleans, *Vice-President*; Dr. F. A. Rogers, Brewster, *Secretary*; Dr. C. M. Hulbert, South Dennis, *Treasurer and Librarian.*

Berkshire.—Dr. J. F. A. Adams, Pittsfield, *President*; Dr. D. M. Wilcox, Lee, *Vice-President*; Dr. H. Colt, Jr., Pittsfield, *Secretary*; Dr. W. M. Mercer, Pittsfield, *Treasurer*; Dr. W. E. Vermilye, Pittsfield, *Librarian.*

Bristol North.—Dr. J. P. Brown, Taunton, *President*; Dr. G. B. Cogswell, North Easton, *Vice-President*; Dr. E. F. Galligan, Taunton, *Secretary*; Dr. C. Howe, Taunton, *Treasurer*; Dr. J. B. Murphy, Taunton, *Librarian.*

Bristol South.—Dr. F. A. Sawyer, Wareham, *President*; Dr. G. T. Hough, New Bedford, *Vice-President*; Dr. A. M. Pierce, New Bedford, *Secretary, Treasurer and Librarian.*

Essex North.—Dr. J. A. Douglass, Amesbury, *President*; Dr. E. P. Hurd, Newburyport, *Vice-President*; Dr. G. W. Snow, Newburyport, *Secretary and Treasurer.*

Essex South.—Dr. C. C. Pike, Peabody, *President*; Dr. A. M. Tupper, Rockport, *Vice-President*; Dr. C. C. Sheldon, Lynn, *Secretary*; Dr. W. Neilson, Salem, *Treasurer*; Dr. G. Z. Goodell, Salem, *Librarian.*

Franklin.—Dr. E. C. Coy, Montague City, *President*; Dr. G. R. Fessenden, Ashfield, *Vice-President*; Dr. A. C. Deane, Greenfield, *Secretary, Treasurer and Librarian.*

Hampden.—Dr. G. S. Stebbins, Springfield, *President;* A. F. Reed, Holyoke, *Vice-President;* Dr. G. C. McClean, Springfield, *Secretary, Treasurer and Librarian.*

Hampshire.—Dr. W. Lester, South Hadley, *President;* Dr. D. W. Miner, Ware, *Vice-President;* Dr. C. W. Cooper, Northampton, *Secretary;* Dr. J. Dunlap, Northampton, *Treasurer;* Dr. C. Seymour, Northampton, *Librarian.*

Middlesex East.—Dr. J. O. Dow, Reading, *President;* Dr. W. F. Stevens, Stoneham, *Vice-President;* Dr. G. E. Putney, Reading, *Secretary;* Dr. J. O. Dow, Reading, *Treasurer and Librarian.*

Middlesex North.—Dr. W. Bass, Lowell, *President;* Dr. W. H. Leighton, Lowell, *Vice-President;* Dr. G. C. Osgood, Lowell, *Secretary;* Dr. N. B. Edwards, North Chelmsford, *Treasurer;* Dr. W. B. Jackson, Lowell, *Librarian.*

Middlesex South.—Dr. Z. B. Adams, Framingham, *President;* Dr. S. W. Driver, Cambridge, *Vice-President;* Dr. W. Ela, Cambridge, *Secretary;* Dr. J. W. Willis, Waltham, *Treasurer;* Dr. W. A. Winn, Arlington, *Librarian.*

Norfolk.—Dr. J. H. Streeter, Roxbury, *President;* Dr. A. R. Holmes, Canton, *Vice-President;* Dr. G. D. Townshend, Roxbury, *Secretary and Librarian;* Dr. E. G. Morse, Roxbury, *Treasurer.*

Plymouth.—Dr. F. Collamore, North Pembroke, *President;* Dr. H. F. Borden, Brockton, *Vice-President;* Dr. J. E. Bacon, Brockton, *Secretary and Treasurer;* Dr. A. A. MacKeen, South Abington, *Librarian.*

Suffolk.—Dr. J. C. White, Boston, *President;* Dr. G. B. Shattuck, Boston, *Vice-President;* Dr. C. M. Green, Boston, *Secretary;* Dr. E. M. Buckingham, Boston, *Treasurer;* Dr. B. J. Jeffries, Boston, *Librarian.*

Worcester.—Dr. A. Wood, Worcester, *President;* Dr. G. C. Webber, Millbury, *Vice-President;* Dr. O. H. Everett, Worcester, *Secretary;* Dr. J. O. Marble, Worcester, *Treasurer;* Dr. L. Wheeler, Worcester, *Librarian.*

Worcester North.—Dr. R. F. Andrews, Gardner, *President;* Dr. L. Pillsbury, Fitchburg, *Vice-President;* Dr. C. H. Rice, Fitchburg, *Secretary;* Dr. E. P. Miller, Fitchburg, *Treasurer;* Dr. F. H. Thompson, Fitchburg, *Librarian.*

Massachusetts Medical Society.

PROCEEDINGS OF THE COUNCILLORS.

October 1, 1884.

A Stated Meeting of the Councillors was held in the hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Wednesday, October 1, 1884, at 11 o'clock, A.M.

The President, Dr. C. D. Homans, in the chair.

The following Councillors were present:

Berkshire.
O. J. Brown.

Bristol North.
J. R. Bronson,
S. D. Presbrey.

Bristol South.
J. Dwelly,
J. H. Mackie,
F. A. Sawyer,
J. J. B. Vermyne.

Essex North.
D. Dana,
O. T. Howe,
J. C. Pennington.

Essex South.
H. Colman,
W. W. Eaton,
W. A. Gorton,
A. H. Johnson,
C. A. Lovejoy.

Franklin.
A. C. Deane.

Middlesex East.
F. Winsor.

Middlesex North.
C. Dutton,
F. Nickerson.

Middlesex South.
A. P. Clarke,
E. R. Cutler,
C. K. Cutter,
J. A. Dow,
W. W. Dow,
J. L. Hildreth,
R. L. Hodgdon,
H. E. Marion,
G. C. Pierce,
L. R. Stone,
A. C. Webber,
J. W. Willis.

Norfolk.
H. P. Bowditch,
T. T. Cushman,
J. A. Gordon,
J. G. S. Hitchcock,
I. H. Hazelton,
H. T. Mansfield,
J. H. Richardson,
J. Seaverns,
C. C. Tower,
D. B. Van Slyck,
E. T. Williams,
J. A. Winkler.

Plymouth.
H. W. Dudley,
J. C. Gleason.

Suffolk.
S. L. Abbot,
J. Ayer,
H. H. A. Beach,
C. J. Blake,
H. I. Bowditch,

S. Cabot,
D. W. Cheever,
F. W. Draper,
J. R. Draper,
R. H. Fitz,
C. F. Folsom,
W. H. H. Hastings,
R. M. Hodges,
C. D. Homans,
J. Homans,
B. J. Jeffries,
F. Minot,
J. P. Reynolds,
B. S. Shaw,
A. D. Sinclair,
C. W. Swan,
J. C. Warren,
H. W. Williams.

Worcester.
G. Brown,
W. Davis,
G. E. Francis,
H. B. Harvey.

Worcester North.
B. H. Hartwell,
Ira Russell.

Total, 74.

The record of the previous meeting was read and accepted.

On nomination by the President the following were appointed Delegates to other State Medical Societies:

Vermont.—Drs. A. M. Smith, of Williamstown; N. S. Babbitt, of North Adams.

New York.—Drs. A. C. Deane, of Greenfield; F. K. Paddock, of Pittsfield.

Dr. Hodges for the Committee on Publications stated that the Society's Prize fails to induce competition, and the Committee had therefore decided to request that, instead of the prize as now offered, the income of the Shattuck fund be appropriated for the objects set forth in the terms of the bequest of the donor. In behalf of the Committee he offered the following:

Voted,—That the Committee on Publications be directed and authorized to offer a prize of one thousand dollars for an essay on the climate and its modifications as influencing health and disease, or on any of the diseases of the inhabitants of New England, or on any kindred subject, such essay, with a sealed envelope containing the author's name, to be delivered to the Chairman of the Committee on Publications on or before the first day of March, of the year 1888. It is understood that such prize shall be given at the annual meeting of that year, and only to an essay deemed worthy of it by the Committee.

After discussion it was voted, that the report be accepted and its recommendation adopted.

The Committee on Membership and Resignations reported through Dr. Ayer. In accordance with their recommendation the following were allowed to retire:

Drs. Warren Tyler, of North Brookfield.
Asa Millet, of East Bridgewater.

Also the following was allowed to resign:

Dr. George B. Swasey, of Westminster.

Dr. Hodges, Chairman of the Committee appointed to consider the petition for the establishment of the Norfolk South District Medical Society, to consist of the Fellows of the Massachusetts Medical Society residing in the towns of Quincy, Braintree, Randolph, Holbrook, Weymouth, Hingham and Cohasset, reported that the District Societies of Norfolk and Plymouth, duly and individually notified, had been given a hearing, at which the proposal was discussed. The Committee recommended that the petition be granted.

Voted.—That the recommendation of the Committee be adopted.

Voted,—That Dr. Horace Richardson, of Boston, be restored to membership in the Society.

Adjourned at 12.15, P.M.

FRANCIS W. GOSS,
Recording Secretary.

February 4, 1885.

A Stated Meeting of the Councillors was held in the hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Wednesday, February 4, 1885, at 11 o'clock, A.M.

The President, Dr. C. D. Homans, in the chair.

The following Councillors were present:

Bristol North.
J. R. Bronson,
S. D. Presbrey.

Bristol South.
F. A. Sawyer,
J. J. B. Vermyne.

Essex North.
J. C. Pennington.

Essex South.
W. A. Gorton,
A. H. Johnson,
T. Kittredge,
S. W. Torrey.

Hampden.
G. L. Woods.

Middlesex East.
A. H. Cowdrey,
F. Winsor.

Middlesex North.
C. Dutton,
F. Nickerson,
M. G. Parker,
G. E. Pinkham,
F. C. Plunkett.

Middlesex South.
A. P. Clarke,
E. R. Cutler,
C. K. Cutter,
R. L. Hodgdon,
H. E. Marion,
L. R. Stone,
G. J. Townsend,
C. E. Vaughan,
A. C. Webber,
H. C. White,
J. W. Willis,
M. Wyman.

Norfolk.
H. P. Bowditch,
G. A. Bragdon,
T. T. Cushman,
J. A. Gordon,
C. C. Hayes,
J. G. S. Hitchcock,
I. H. Hazelton,
C. C. Tower,
J. A. Winkler.

Plymouth.
H. W. Dudley,
J. C. Gleason,
B. F. Hastings,
A. E. Paine.

Suffolk.
J. Ayer,
C. J. Blake,
D. W. Cheever,
H. Curtis,
O. W. Doe,
F. W. Draper,
R. H. Fitz,
J. O. Green,
S. A. Green,
W. H. H. Hastings,
R. M. Hodges,
C. D. Homans,
B. J. Jeffries,
G. H. Lyman,
W. L. Richardson,
G. C. Shattuck,
A. D. Sinclair,
C. W. Swan,
O. F. Wadsworth,
H. W. Williams.

Worcester.
A. G. Blodgett,
W. Davis,
E. B. Harvey,
L. Wheeler.

Worcester North.
B. H. Hartwell,
J. P. Lynde,
Ira Russell.

Total, 69.

The record of the last meeting was read and accepted.

On nomination by the President the following were appointed Delegates to other State Medical Societies:

Maine.—Drs. J. E. Pratt, of Sandwich; T. R. Clement, of Centreville.

New Hampshire.—Drs. C. C. Pike, of Peabody; C. C. Odlin, of Melrose.

Rhode Island.—Drs. J. R. Bronson, of Attleboro'; B. D. Gifford, of Chatham.

Connecticut.—Drs. G. N. Munsell, of Harwich; S. T. Davis, of Orleans.

New Jersey.—Drs. G. W. Doane, of Hyannis; R. H. Faunce, of Sandwich.

The following Committees were appointed:

To Audit the Treasurer's Accounts.—Drs. J. O. Marble, I. H. Hazelton.

To Examine the Library.—Drs. Z. B. Adams, A. H. Johnson.

To Examine the By-Laws of District Societies.—Drs. S. D. Presbrey, J. C. White, F. W. Chapin.

The Committee on Membership reported through Dr. Ayer. In accordance with their recommendation the following was allowed to resign:

Dr. Edward C. Atwood, of Daytona, Florida.

Also, the following were allowed to retire:

Drs. Ebenezer C. Richardson, of Ware.
George Faulkner, of Jamaica Plain.

Also, the following were dropped from the roll for non-payment of dues:

Drs. Henry O. Adams, of South Royalston.
George B. Ambrose, of Boston.
James R. Barss, of Malden.
John W. Crawford, of Lawrence.
Alfred O. Hitchcock, of Fitchburg.
James H. McDonnell, of Waltham.

Also, the following, having forfeited their membership under By-Law VI., were dropped from the roll:

Drs. James H. Bullard, of San Mateo, Cal.
Charles H. Call, of Vermilion, Dakota.
William S. Dennett, of New York, N. Y.
Harmon Heed, of Warehouse Point, Conn.
Charles D. Hunking, of New York, N. Y.
James Macdonald.
John A. McKinnon, of Maysville, Mo.
Solon B. Stone, U. S. Army.
James H. Stuart, of San Francisco, Cal.
Frank B. Wilder, of Evanston, Ill.

In accordance with the recommendation of the Committee on Medical Diplomas, it was

Voted,—That the following Medical Schools be added to the list of Colleges whose degrees are recognized by the Society:

University of Berne.
University of Zurich.
Woman's Medical College of the New York Infirmary.
Woman's Medical College of Pennsylvania.
School of Medicine in Paris.

It was also voted that graduates of all foreign Regular Medical Schools which are under government supervision, and graduates of all foreign Regular Medical Schools not under government supervision who have obtained a license to practise in any foreign country, shall be eligible for examination by the Censors.

In case any applicant for admission [possessing a foreign medical diploma] should not belong to either of these two classes, the Censors shall refer the degree held by the applicant to the Committee on Diplomas for instruction.

The Committee appointed at the last meeting "to consider if it be proper to take steps to change the Constitution and By-Laws in regard to the Boards of Censors" reported through Dr. Hazelton, that it is not advisable to take action toward the establishment of a Central Board of Censors. The report called attention to the lack of uniformity in the methods of examination in the different Districts, and suggested that some agreement be brought about between them.

Adjourned at 12.30, P.M.

FRANCIS W. GOSS,
Recording Secretary.

Annual Meeting.

The Annual Meeting of the Councillors was held in the hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Tuesday, June 9, 1885, at 7 o'clock, P.M.

The President, Dr. C. D. Homans, in the chair.

The following Councillors were present:

Berkshire.
O. J. Brown,
C. W. Burton,
H. J. Millard.

Bristol North.
A. S. Deane,
J. Murphy,
W. S. Robinson.

Bristol South.
J. Dwelly,
J. H. Mackie,
C. D. Prescott,
J. J. B. Vermyne,
J. B. Whitaker.

Essex North.
J. Crowell,
R. C. Huse,
O. Warren,
J. F. Young.

Essex South.
H. Colman,
J. S. Emerson,
I. F. Galloupe,
W. A. Gorton,
A. H. Johnson,
C. A. Lovejoy,
T. L. Perkins.

Franklin.
A. C. Walker.

Hampden.
J. S. Bagg,
T. F. Breck,
L. S. Brooks,
J. B. Hyland,
G. C. McClean.

Hampshire.
C. W. Cooper,
C. L. Knowlton,
F. Tuckerman,
J. Yale.

Middlesex East.
S. W. Abbott,
J. S. Clark,
F. W. Graves.

Middlesex North.
C. Dutton,
N. B. Edwards,
M. G. Parker,
F. C. Plunkett.

Middlesex South.
A. P. Clarke,
E. Cowles,
C. K. Cutter,
J. A. Dow,
W. W. Dow,
J. L. Hildreth,
R. L. Hodgdon,
A. Hosmer,
G. C. Pierce,
E. H. Stevens,
L. R. Stone,
J. L. Sullivan,
G. J. Townsend,
C. E. Vaughan,
H. P. Walcott,
A. C. Webber,
H. C. White,
J. W. Willis.

Norfolk.
C. C. Hayes,
J. G. S. Hitchcock,
I. H. Hazelton,
H. T. Mansfield,
G. E. Mecuen,
J. H. Richardson,
J. Seaverns,
E. T. Williams.

Norfolk South.
T. H. Dearing,
G. W. Fay,
C. C. Tower.

Plymouth.
H. W. Dudley,
J. C. Gleason,
B. F. Hastings.

Suffolk.
S. L. Abbot,
J. Ayer,
C. J. Blake,
H. I. Bowditch,
A. T. Cabot,

O. W. Doe,
F. W. Draper,
J. R. Draper,
S. H. Durgin,
T. Dwight,
R. H. Fitz,
C. F. Folsom,
G. W. Gay,
J. O. Green,
S. A. Green,
F. B. Greenough,
W. H. H. Hastings,
C. D. Homans,
J. Homans,
W. Ingalls,
B. J. Jeffries,
S. W. Langmaid,
M. B. Leonard,
G. H. Lyman,
F. Minot,
C. B. Porter,
J. P. Reynolds,
W. L. Richardson,
G. C. Shattuck,
B. S. Shaw,
A. D. Sinclair,
A. M. Sumner,
C. W. Swan,
G. G. Tarbell,
O. F. Wadsworth,
T. Waterman,
J. C. White,
H. W. Williams.

Worcester.

A. G. Blodgett,
G. Brown,
W. Davis,
G. E. Francis,
T. H. Gage,
E. B. Harvey,
W. E. Rice,
G. C. Webber,
J. O. West,
L. Wheeler,
A. Wood.

Worcester North.

B. H. Hartwell,
G. Jewett,
J. P. Lynde,
Ira Russell,
F. H. Thompson.

Total, 125.

The record of the previous meeting was read and accepted.

The Secretary read the names of new and of deceased Fellows.

The Treasurer, Dr. Draper, read his annual report.

The Auditing Committee reported that they found the accounts properly vouched and correctly cast; also that they reviewed the evidences of the Society's invested funds and found them to correspond with the schedule exhibited.

The Treasurer's report was then accepted.

The Committee on Finances reported through Dr. Minot and recommended the following amendment to By-Law XX.

Instead of the words, "Thursday before the last Saturday of September and February" (lines 14 and 15), read "third Thursday of September and December."

Also that $1368.58, being eighty per cent. of the balance remaining in the treasury, be distributed among the District Societies.

The report of the Committee was accepted and its recommendations were adopted.

The Committee on Membership and Resignations reported through Dr. Ayer. In accordance with their recommendation it was voted that the following be allowed to resign:

Drs. Rollin H. Knowles, of Belleville, Ill.
David H. Nutting, of Randolph, Vt.
John Trumbull, of Valparaiso, Chili.
Caleb B. Underhill, of Salida, Col.

Also that the following be allowed to retire:

Drs. George W. Burdett, of Clinton.
Charles Howe, of Taunton.
Woodbridge R. Howes, of Hanover.
Joseph Murphy, of Taunton.
George W. Pierce, of Leominster.
Ira Russell, of Winchendon.
Lucius L. Scammell, of St. Louis, Mo.
George A. Warren, of Hopkinton.

Also that the following be restored to membership:

Dr. Richard James Plummer Goodwin, of East Boston.

The Committee on the Library reported, through Dr. Z. B. Adams, that the Library consists mainly of reports of various Medical Societies. They recommended that this property, and all similar publications hereafter received, be given to the Boston Medical Library, on condition that they be accessible to members of the Society.

They also recommended that fifty dollars be appropriated from the funds of the Society to aid in binding the pamphlets donated.

The report was accepted and its recommendations were adopted.

The Committee on Nominations, through Dr. Crowell, reported a list of candidates for the offices of the Society for the ensuing year, and the same were elected by ballot:

President . .	Dr. Charles D. Homans, of Boston.
Vice President . .	Dr. George N. Munsell, of Harwich.
Treasurer . .	Dr. Frank W. Draper, of Boston.
Corresponding Secretary	Dr. Charles W. Swan, of Boston.
Recording Secretary .	Dr. Francis W. Goss, of Roxbury.
Librarian . .	Dr. Edwin H. Brigham, of Boston.

Dr. Richard M. Hodges, of Boston, was chosen Orator, and

Dr. Edwin B. Harvey, of Westboro', Anniversary Chairman, for the next Annual Meeting.

Voted,—That the next Annual Meeting be held in Boston, on the second Wednesday in June, 1886.

On nomination by the President, the following Standing Committees were appointed.

Of Arrangements.

H. C. Haven, J. W. Elliot, J. B. Swift,
C. H. Williams, F. H. Hooper, H. C. Ernst.

On Publications.

G. C. Shattuck, R. M. Hodges, B. E. Cotting.

On Membership and Resignations.

J. Ayer, D. W. Cheever, J. Stedman.

On Finances.

F. Minot, B. S. Shaw, E. G. Cutler.

To Procure Scientific Papers.

C. W. Swan, G. S. Stebbins, J. R. Chadwick,
R. H. Fitz, H. P. Walcott.

On Ethics and Discipline.

G. J. Townsend, G. E. Francis, A. H. Johnson,
C. Howe, F. C. Shattuck.

On Medical Diplomas.

W. L. Richardson, A. H. Cowdrey, E. J. Forster.

The Committee on Medical Diplomas, to whom was committed the petition of the College of Physicians and Surgeons, of Boston, to be placed on the list of Colleges

whose diplomas are recognized by the Society, recommended, after a careful consideration of the petition, that the degree of the College in question be not recognized by the Massachusetts Medical Society.

The report of the Committee was accepted and its recommendation adopted.

Voted,—That the town of Hull be transferred to the Norfolk South District.

Voted,—That in By-Law XX., lines 31–33, the words "provided, however, that the whole amount paid to any one Board shall not exceed the sum of sixty dollars for any single year," be stricken out.

Voted,—To amend By-Law XXIX., by striking out in line 29 the words "A Committee, who shall report the same to."

The President gave a cordial invitation to the Councillors to the hospitalities of his house on adjournment of the meeting.

Adjourned at 9.15, P.M.

FRANCIS W. GOSS,
Recording Secretary.

Massachusetts Medical Society.

PROCEEDINGS OF THE SOCIETY.

ANNUAL MEETING.

First Day.

The Society met in Huntington Hall, Institute of Technology, Boston, on Tuesday, June 9, 1885, at 12 o'clock, M.

The President, Dr. C. D. Homans, in the chair.

The following papers were read:

1. The Pathogenesis of Certain Affections of the Skin.—By George H. Tilden, M.D., of Boston.
2. Consanguineous Marriages: Their Effect upon Offspring.—By Charles F. Withington, M.D., of Roxbury.
3. Labor Complicated with Fibroids.—By James R. Chadwick, M.D., of Boston.

Adjourned at 2 o'clock, P.M.

At 3 o'clock, P.M., the reading of papers was resumed.

4. The Climatic Treatment of Phthisis.—By Harold Williams, M.D., of Boston.
5. How a Lesion of the Brain Results in that Disturbance of Consciousness Known as Aphasia.—By Morton H. Prince, M.D., of Boston.
6. Some of the Mental Aspects of Nervous Disease.—By Henry R. Stedman, M.D., of Boston.

Adjourned at 5 o'clock, P.M.

FRANCIS W. GOSS,
Recording Secretary.

Second Day.

The Society met in Huntington Hall, Boston, on Wednesday, June 10, 1885, at 9 o'clock, A.M., for the exercises of the one hundred and fourth Anniversary.

The President, Dr. C. D. Homans, in the chair.

The record of the last annual meeting was read and accepted.

The Secretary read the names of Fellows admitted since the last annual meeting, and of Fellows whose deaths had been reported.

Fellows admitted since June 10, 1884.

1884	Abbé, Alanson Joseph	Somerville.
1885	Allen, Gardner Weld	Boston.
1884	Ayer, Silas Hibbard	Boston.
1885	Barnard, Rebecca	Worcester.
1885	Bell, Robert	Roxbury.
1885	Berlin, Fanny	Boston.
1885	Birmingham, Robert Michael	Lawrence.
1884	Birtwell, Charles Ebenezer	Lawrence.
1885	Boardman, William Sydney	Boston.
1884	Brewer, George Emerson	Boston.
1885	Bridgham, Samuel Crosby	Braintree.
1884	Broidrick, James Patrick	Jamaica Plain.
1885	Brown, Frank Dillon	Boston.
1884	Brown, George Artemas	Barre.
1885	Burgess, Oliver Graham	Boston.
1885	Burt, Frank Leslie	Boston.
1884	Call, Emma Louisa	Boston.
1884	Cogswell, Charles Hale	Boston.
1885	Coolidge, Algernon, Jr.	Boston.
1885	Crawford, Sarah Marcy	Roxbury.
1884	Dearing, Howard Sumner	Boston.
1885	Dorr, Charles Alonzo	Hingham.
1885	Drew, Charles Aaron	Taunton.
1884	Field, James Brainerd	Lowell.
1885	French, George Morrill	Malden.
1885	Frissell, Seraph	Springfield.
1884	Frye, Charles Marshall	Pittsfield.
1884	Fuller, Eugene	Boston.

1884	Gage, James Arthur . . .	Boston.
1884	Greenleaf, Robert Willard . .	Boston.
1884	Griffin, Arthur George . . .	Boston.
1884	Harrington, Harriet Louise . .	Dorchester.
1884	Harrower, David	Worcester.
1885	Henry, John Goodrich . . .	Winchendon.
1885	Herrick, Joseph Thomas . .	Springfield.
1884	Homans, John, 2d	Boston.
1885	Hough, Garry de Nerville . .	New Bedford.
1885	Howard, Herbert Burr . . .	Tewksbury.
1885	Hyland, Jesse Burdette . . .	Palmer.
1885	Ingraham, Lena Vaughn . .	Boston.
1884	Jackson, Henry	Boston.
1884	Jarvis, William Furness . .	Waltham.
1885	Jewett, Milo Augustus . . .	Danvers.
1885	Jordan, Herbert Stanton . .	Waltham.
1884	Keith, Wallace Cushing . . .	Brockton.
1884	Kennedy, Frederick William .	Lawrence.
1885	Kingsbury, Joseph Byron . .	Holbrook.
1884	Laidley, John Baine . . .	Conway.
1884	Lane, Edward Binney . . .	South Boston.
1885	Lincoln, John Clifford . . .	Hyde Park.
1884	Little, William Brimblecom . .	Lynn.
1884	Lovett, Robert Williamson . .	Boston.
1885	Lynch, Samuel Bartlett . . .	Boston.
1885	Macdonald, William Gregory .	South Boston.
1885	Mackie, Laura V. Gustin . .	Attleboro'.
1885	Marsh, James Elmer . . .	Maynard.
1885	Maryott, Erastus Edgar . .	Merrick.
1884	McOwen, Timothy Edward . .	Lowell.
1885	Mignault, Rodrigue . . .	Lowell.
1885	Miller, Norman Rogers . . .	Holyoke.
1885	Mossman, Alvaro E . . .	Westminster.
1884	Munro, John Cummings . .	Boston.
1884	Munro, Walter Lee . . .	Boston.
1884	Murphy, Frank Charles . .	Boston.
1884	Murphy, Joseph Patrick . .	Brookline.
1885	O'Callaghan, Mary Vincent . .	Worcester.
1885	Pagelsen, Margaret Emily . .	Tewksbury.
1885	Perry, Martha	Taunton.
1885	Pfeiffer, Oscar Joseph . . .	Denver, Col.
1885	Pitcher, Herbert Frank . . .	Haverhill.
1884	Potter, Silas Allen . . .	Roxbury.
1885	Prescott, Royal Blood . . .	Lowell.
1884	Reynolds, Edward	Boston.
1885	Ring, Allan Mott	Arlington Heights.

1885	Round, Arthur Morey . . .	Norton.
1884	Sawin, Charles Dexter . . .	Charlestown.
1884	Sawyer, Elihu LeRoy . . .	Oakham.
1885	Schram, Charles	Boston.
1884	Sears, George Gray . . .	Boston.
1885	Sheedy, Bryan DeForest . .	Northampton.
1885	Simpson, Charles Edward . .	Lowell.
1884	Sleeper, Walter Julian . . .	Westford.
1884	Smyth, Herbert Edmund . .	Marlboro'.
1884	Spring, Clarence Walter . .	Fitchburg.
1885	Steadman, Augusta Alice . .	Taunton.
1885	Stabler, Augustus	Lawrence.
1884	Stetson, Hayward	Boston.
1884	Stone, Eugene Potter . . .	Washington, D. C.
1885	Swan, William Donnison . .	Boston.
1885	Taylor, Charles Warren . .	Lowell.
1885	Tremain, William Allen . .	Attleboro'.
1885	Townsend, Charles Wendell . .	Boston.
1885	Vincelette, Arthur Edouard Zéphirin	Lowell.
1885	Webber, Amos Paterson . .	New Bedford.
1885	Welles, Frank Martin	Chelsea.
1885	Whitaker, Clarence Wilder . .	Yarmouthport.
1885	Whitney, Adeline Stearns . .	Roxbury.
1885	Wilkin, Anna Mary . . .	Sherborn.
1884	Willard, Oliver Augustus . .	Lowell.
1885	Winn, Albert	Wakefield.
1885	Wolcott, Grace	Boston.
1884	Wood, Leonard	Boston.
1884	Wood, Stephen Andrew . . .	Bedford.
1885	Young, Leyander John . . .	Haverhill.

Total, 104.

List of Deceased Fellows.

Admitted.	Name.	Residence.	Date of Death.	Age.
1838	Adams, Abel Bryant	Lexington	Aug. 13, 1884	73
1835	Alexander, Andrew	Dorchester	April 22, 1885	73
1867	Batchelder, Joseph Cummings	Templeton	April 26, 1885	76
1843	Cabot, Samuel	Boston	April 13, 1885	69
1867	Chamberlain, Nathan Savery	Marlboro'	Oct. 31, 1884	38
1836	Clark, Luther	Newtonville	Sept. 26, 1884	74
1843	Currier, William Jackson	Lexington	Oct. 27, 1884	69
1862	Damon, Howard Franklin	Boston	Sept. 17, 1884	52
1837	Dix, John Homer	Boston	Aug. 25, 1884	72
1883	Downing, Alfred Clark	Roxbury	May 11, 1885	36
1841	Duncan, Charles Morris	Shelburne	Oct. 4, 1884	76
1852	Fisk, Samuel Augustus	Northampton	Nov. 16, 1884	63
1869	Gage, William Hathorne	Taunton	April 21, 1885	54
1859	Gould, Joseph Ferdinand	South Boston	June 5, 1885	55
1866	Hall, Marquis	Spencer	June 2, 1884	49
1836	Hooper, Robert William	Boston	April 13, 1885	74
1849	Howard, Levi	Chelmsford	Jan. 23, 1885	65
1882	Huse, Charles Archelaus	Worcester	July 3, 1884	29
1833	Jarvis, Edward	Dorchester	Oct. 31, 1884	81
1880	Langworthy, Frank Abner	Lakewood, NJ	Aug. 31, 1884	34
1839	Learned, Ebenezer Turell	Fall River	Feb. 12, 1885	72
1846	Martin, Henry Austin	Roxbury	Dec. 7, 1884	60
1842	Osgood, Jonathan Walter Dandolo	Greenfield	May 16, 1885	83
1856	Osgood, William	Boston	April 10, 1885	62
1840	Pierce, John	Edgartown	March 22, 1885	79
1879	Randall, James Monroe	Leominster	Nov. 4, 1884	27
1881	Sprague, William Lawrence	Boston	June 22, 1884	34
1849	Thorndike, William Henry	Boston	Dec. 26, 1884	60
1864	Treadwell, Joshua Brackett	Boston	May 6, 1885	44
1881	White, Andrew Marion William	Fall River	Jan. 5, 1885	42
1831	Wing, Benjamin Franklin	Jamaica Plain	Aug. 1, 1884	79

Total, 31.

The Treasurer Dr. Draper read his annual report.

Voted,—That when the Society adjourns it be to meet on October 7, 1885, at 12.30, P.M., at the place where the Councillors shall meet on that day.

A circular was read containing resolutions passed by the Association of Medical Superintendents of American Institutions for the Insane, requesting the medical profession to unite with the Association in urging Congress to pass enactments to effectively prevent the emigration and exportation to our ports of the so-called defective classes of Europe and Asia.

Voted,—That the Society unite with the Association for the purposes set forth in their communication.

Papers were read as follows:

7. CREMATION IN ITS SANITARY ASPECTS.—By John O. Marble, M.D., of Worcester.

8. DIAGNOSIS AND TREATMENT OF OCCIPITO-POSTERIOR POSITIONS.—By William L. Richardson, M.D., of Boston.

9. THE INFLUENCE OF OVARIOTOMY ON SURGERY.—By John Homans, M.D., of Boston.

The following Delegates from other State Medical Societies were introduced and made brief responses:

New Hampshire.—Dr. C. R. Walker.
Vermont.—Dr. E. S. Albee.
Connecticut.—Dr. A. B. Worthington.
New York.—Drs. M. L. Bates, P. Faling.

At 12 o'clock the Annual Discourse was delivered by Dr. F. K. PADDOCK, of Pittsfield.

At the close of the oration a vote of thanks was presented to the orator for his very instructive and interesting address.

At 1, P.M., the Society adjourned to the Winslow Skating Rink, where the eighty-fourth Annual dinner, presided over

by the Anniversary Chairman, Dr. Robert Amory, was served to more than seven hundred Fellows.

FRANCIS W. GOSS,
Recording Secretary.

TREASURER'S REPORT.

The Treasurer respectfully presents the following statement of the Society's finances for the year ending April 15, 1885:

Balance from last year's accounts . .	$1562 86
Receipts from various sources during the year	8459 89
	10022 75
Expenses during the year . . .	8312 02
Balance on hand	$1710 73

The accompanying exhibit gives a full analysis of these receipts and disbursements.

The invested funds of the Society have remained without change since the last report; they amount to $32,420.17, and yield interest at the rate of four per cent.

The dues of delinquent Fellows were remitted in the past year to the amount of $100.00, by vote of the Councillors, upon the recommendation of the Finance Committee.

The names of eight members, who owed more than five annual assessments, were dropped from the Rolls in accordance with the provisions of By-Law VII.; and the names of fourteen Fellows, who had permanently removed

from the State and who neglected to pay their annual dues, were similarly disposed of by the Council, under the requirements of By-Law VI.

The Society now has a membership-list of 1578 Fellows.

F. W. DRAPER,
Treasurer.

BOSTON, June 6, 1885.

The undersigned, a Committee appointed to audit the accounts of the Treasurer, have carefully examined the same, and have the honor to report that they find them properly vouched and correctly cast. Also that they have reviewed the evidences of the Society's invested funds and find them to correspond with the schedule exhibited, amounting to $32,420.17.

J. O. MARBLE, } *Auditing*
ISAAC H. HAZELTON, } *Committee.*

BOSTON, April 29, 1885.

DR. **F. W. Draper, Treasurer, in Account with**

INCOME.

Balance from last account		$1562 86
Assessments paid to the Treasurer		1190 00
Assessments collected by the District Treasurers: —		
Barnstable	$ 100 00	
Berkshire	165 00	
Bristol North	155 00	
Bristol South	190 00	
Essex North	295 00	
Essex South	325 00	
Franklin	75 00	
Hampden	230 00	
Hampshire	190 00	
Middlesex East	130 00	
Middlesex North	390 00	
Middlesex South	385 00	
Norfolk	610 00	
Plymouth	155 00	
Suffolk	1870 00	
Worcester	535 00	
Worcester North	120 00	
		5920 00
Interest account: —		
General Fund	450 12	
Shattuck Fund	366 67	
Phillips Fund	400 00	
Cotting Fund	70 00	
Interest on cash deposited with New England Trust Co.	54 10	
		1340 89
Sale of Diploma		5 00
Sale of Extra Dinner Tickets, June 11, 1884		4 00
		$10,022 75

the Massachusetts Medical Society. CR.

EXPENSE.

On account of Annual Meeting, 1884: —		
Carpenter's bill for building and removing platform in Dining Hall	$45 00	
Caterer's bill	1521 00	
Cigars	96 00	
Incidentals	57 55	
Music	106 00	
Printing	17 25	
Rent of Dining Hall	125 00	
		$1967 90
Committee on Publications:—		
Braithwaite's Retrospect	2260 00	
Printing Annual Publications, 1884	299 88	
		$2559 88
Councillors' Orders:—		
Advertising "Shattuck Prize"	10 00	
Lunches at Stated Meetings (paid by income of Cotting Fund)	90 00	
Triennial Catalogue	349 75	
		449 75
District Societies' account:—		
Censors' fees	279 00	
Dividend, 1884	1328 43	
Printing and Stationery for Censors-at-large	13 82	
Advertising Meetings of Censors-at-large	11 00	
District Treasurers' fees and expenses	339 76	
		1972 01
Librarian's Expenses:—		
Allowance for Clerk	50 00	
Postage and Express	296 51	
Printing	10 90	
Stationery	10 80	
		368 21
Recording Secretary's Expenses:—		
Incidentals	11 00	
Postage	32 00	
Printing	78 87	
Salary	250 00	
Stationery	5 50	
		377 37
Rent to January 1, 1885		125 00
Treasurer's Expenses:—		
Incidentals	1 00	
Postage and Printing	83 95	
Salary	400 00	
Stationery	6 95	
		491 90
		8312 02
Balance to new account		1710 73
		$10,022 75

Officers of the Massachusetts Medical Society.

1885—1886.

Chosen June 9, 1885.

CHARLES D. HOMANS,	Boston, . .	President.
GEORGE N. MUNSELL,	Harwich, . .	Vice-President.
FRANK W. DRAPER, .	Boston, . .	Treasurer.
CHARLES W. SWAN, .	Boston, . .	Cor. Secretary.
FRANCIS W. GOSS, .	Roxbury, . .	Rec. Secretary.
EDWIN H. BRIGHAM,	Boston, . .	Librarian.
RICHARD M. HODGES,	Boston, . .	Orator.
EDWIN B. HARVEY, .	Westboro' .	Anniv. Chairman.

Standing Committees.

Of Arrangements.

H. C. Haven, F. H. Hooper,
C. H. Williams, J. B. Swift,
J. W. Elliot, H. C. Ernst.

On Publications.

G. C. Shattuck, R. M. Hodges, B. E. Cotting.

On Membership and Resignations.

J. Ayer, D. W. Cheever, J. Stedman.

On Finances.

F. Minot, B. S. Shaw, E. G. Cutler.

To Procure Scientific Papers.

C. W. Swan, G. S. Stebbins, J. R. Chadwick,
R. H. Fitz, H. P. Walcott.

On Ethics and Discipline.

G. J. Townsend, G. E. Francis, A. H. Johnson,
C. Howe, F. C. Shattuck.

On Medical Diplomas.

W. L. Richardson, A. H. Cowdrey, E. J. Forster.

Presidents of District Societies—Vice-Presidents (Ex-Officiis.)

(Arranged according to Seniority.)

F. Collamore,	A. Wood,
A. R. Holmes,	G. T. Hough,
Z. B. Adams,	D. M. Wilcox,
D. W. Miner,	C. C. Pike,
F. F. Forsaith,	G. B. Shattuck,
R. F. Andrews,	W. F. Stevens,
W. Bass,	A. F. Reed,
N. Paige,	J. E. Pratt,
J. A. Douglass,	G. R. Fessenden.

Councillors.

Barnstable.—Drs. T. R. Clement, Centreville; S. Pitcher, Hyannis; W. N. Stone, Wellfleet.

Berkshire.—Drs. O. J. Brown, North Adams; C. W. Burton, Adams; C. E. Heath, Lee; W. W. Leavitt, West Stockbridge; H. J. Millard, North Adams; A. M. Smith, Pittsfield.

Bristol North.—Drs. A. S. Deane, Taunton; G. Mackie, Attleboro'; J. Murphy, W. S. Robinson, Taunton; J. E. Totten, Attleboro'.

Bristol South.—Drs. J. Dwelly, Fall River; J. H. Mackie, C. D. Prescott, New Bedford; F. A. Sawyer, Wareham; J. J. B. Vermyne, New Bedford; J. B. Whitaker, Fall River.

Essex North.—Drs. J. Crowell, Haverhill; D. Dana, O. T. Howe, Lawrence; R. C. Huse, Georgetown; J. Pierce, Methuen; J. C. Pennington, Andover; O. Warren, West Newbury; J. F. Young, Newburyport.

Essex South.—Drs. H. Colman, Lynn; W. W. Eaton, Danvers; J. S. Emerson, I. F. Galloupe, Lynn; W. A. Gorton, Danvers; A. H. Johnson, T. Kittredge, Salem; C. A. Lovejoy, Lynn; T. L. Perkins, Salem; G. A. Priest, Manchester; S. W. Torrey, Beverly.

Franklin.—Drs. F. J. Canedy, Shelburne Falls; A. C. Deane, A. C. Walker, Greenfield.

Hampden.—Drs. J. S. Bagg, T. F. Breck, L. S. Brooks, Springfield; U. H. Flagg, Mittineague; G. E. Fuller, Mon-

son; C. P. Hooker, Springfield; J. B. Hyland, Palmer; G. C. McClean, Springfield.

HAMPSHIRE.—Drs. C. W. Cooper, J. Dunlap, C. L. Knowlton, Northampton; F. Tuckerman, Amherst; J. Yale, Ware.

MIDDLESEX EAST.—Drs. S. W. Abbott, Wakefield; J. S. Clark, Melrose; F. W. Graves, Woburn.

MIDDLESEX NORTH.—Drs. C. Dutton, Tyngsboro'; N. B. Edwards, North Chelmsford; C. M. Fisk, Lowell; S. W. Fletcher, Pepperell; A. W. Lavigne, F. Nickerson, M. G. Parker, G. E. Pinkham, F. C. Plunkett, H. J. Smith, Lowell.

MIDDLESEX SOUTH.—Drs. A. P. Clarke, Cambridgeport; E. Cowles, Somerville; E. R. Cutler, Waltham; C. K. Cutter, Charlestown; J. A. Dow, Cambridgeport; W. W. Dow, Somerville; H. M. Field, Newton; J. L. Hildreth, Cambridge; R. L. Hodgdon, Arlington; A. Hosmer, Watertown; H. E. Marion, Brighton; G. C. Pierce, Ashland; E. H. Stevens, North Cambridge; L. R. Stone, Newton; J. L. Sullivan, Malden; G. J. Townsend, South Natick; C. E. Vaughan, H. P. Walcott, Cambridge; A. C. Webber, Cambridgeport; H. C. White, East Somerville; J. W. Willis, Waltham.

NORFOLK.—C. C. Hayes, Hyde Park; I. H. Hazleton, Wellesley Hills; J. G. S. Hitchcock, Foxboro'; H. T. Mansfield, Needham; G. E. Mecuen, Roxbury; J. H. Richardson, Medfield; O. F. Rogers, Dorchester; J. Seaverns, Roxbury; D. B. Van Slyck, Brookline; E. T. Williams, Roxbury; J. A. Winkler, Jamaica Plain.

NORFOLK SOUTH.—Drs. T. H. Dearing, Braintree; G. W. Fay, East Weymouth; C. C. Tower, South Weymouth.

PLYMOUTH.—Drs. J. B. Brewster, Plymouth; H. W. Dudley, Abington; J. C. Gleason, Rockland; B. F. Hastings, South Abington; W. R. Howes, Hanover.

SUFFOLK.—Drs. S. L. Abbot, J. Ayer, H. H. A. Beach, H. J. Bigelow, C. J. Blake, J. G. Blake, H. I. Bowditch, A. T. Cabot, D. W. Cheever, H. Curtis, H. Derby, O. W. Doe, F. W. Draper, *Treasurer*, Boston; J. R. Draper, South Boston;

S. H. Durgin, T. Dwight, R. T. Edes, R. H. Fitz, C. F. Folsom, G. W. Gay, J. O. Green, S. A. Green, F. B. Greenough, W. H. H. Hastings, R. M. Hodges, C. D. Homans, *President*, J. Homans, W. Ingalls, B. J. Jeffries, F. I. Knight, S. W. Langmaid, Boston; M. B. Leonard, East Boston; G. H. Lyman, F. Minot, C. B. Porter, J. P. Reynolds, W. L. Richardson, G. C. Shattuck, B. S. Shaw, A. D. Sinclair, D. H. Storer, A. M. Sumner, C. W. Swan, *Corresponding Secretary*, G. G. Tarbell, O. F. Wadsworth, J. C. Warren, T. Waterman, Boston; W. G. Wheeler, Chelsea; J. C. White, E. N. Whittier, H. W. Williams, Boston.

Worcester.—Drs. A. G. Blodgett, West Brookfield; G. Brown, Barre; W. Davis, G. E. Francis, T. H. Gage, Worcester; E. B. Harvey, Westboro'; G. M. Morse, Clinton; J. G. Park, J. M. Rice, Worcester; W. E. Rice, New England Village; E. Warner, Worcester; G. C. Webber, Millbury; J. O. West, Princeton; L. Wheeler, A. Wood, Worcester.

Worcester North.—Drs. B. H. Hartwell, Ayer; G. Jewett, Fitchburg; J. P. Lynde, Athol; I. Russell, Winchendon; F. H. Thompson, Fitchburg.

Censors.

Barnstable.—Drs. G. W. Doane, Hyannis; R. H. Faunce, Sandwich; H. S. Kelley, Dennisport; G. N. Munsell, Harwich; W. N. Stone, Wellfleet.

Berkshire.—Drs. F. K. Paddock, Pittsfield; T. Riley, Adams; I. R. Sanford, Sheffield; A. M. Smith, Williamstown; F. P. Whittlesey, Great Barrington.

Bristol North.—Drs. C. A. Atwood, Taunton; J. B. Gerould, North Attleboro'; M. C. Golden, F. A. Hubbard, M. Perry, Taunton.

Bristol South.—Drs. G. S. Eddy, Fall River; H. S. B. Smith, Middleboro'; W. N. Swift, W. H. Taylor, New Bedford; J. Q. A. Tourtelot, Fall River.

ESSEX NORTH.—Drs. J. Crowell, Haverhill; F. B. Flanders, Lawrence; R. C. Huse, Georgetown; C. C. Talbot, Lawrence; J. F. Young, Newburyport.

ESSEX SOUTH.—Drs. F. A. Durgin, H. G. Gaffney, Salem; C. W. Haddock, Beverly; C. C. Sheldon, Lynn; C. G. Weston, Peabody.

FRANKLIN.—Drs. A. V. Bowker, Miller's Falls; F. J. Canedy, Shelburne Falls; E. A. Deane, Montague; J. H. Goddard, Orange; C. G. Trow, South Deerfield.

HAMPDEN.—Drs. C. D. Brewer, D. Clark, Springfield; F. F. Dole, Chicopee; J. W. Hannum, Ludlow; J. C. Hubbard, Holyoke.

HAMPSHIRE.—Drs. C. W. Cooper, Northampton; J. B. Learned, Florence; D. Pickard, Northampton; H. H. Seelye, Amherst; W. A. Smith, Cummington.

MIDDLESEX EAST.—Drs. W. S. Brown, Stoneham; F. W. Graves, Woburn; D. March, Jr., Winchester; C. C. Odlin, Melrose; F. Winsor, Winchester.

MIDDLESEX NORTH.—Drs. F. W. Chadbourne, Lowell; J. B. Heald, Westford; L. Huntress, J. C. Irish, C. P. Spalding, Lowell.

MIDDLESEX SOUTH.—Drs. W. A. Bell, Somerville; C. H. Cook, Natick; D. M. Edgerly, Cambridgeport; E. Farnham, J. T. G. Nichols, Cambridge.

NORFOLK.—Drs. G. W. Clement, E. F. Dunbar, Roxbury; H. C. Ernst, Jamaica Plain; E. L. Farr, J. B. Moran, Roxbury.

NORFOLK SOUTH.—Drs. S. M. Donovan, Quincy; J. C. Fraser, East Weymouth; F. C. Granger, Randolph; C. E. Prior, Holbrook; J. W. Spooner, Hingham.

PLYMOUTH.—Drs. H. F. Borden, E. A. Chase, S. J. Gruver, Brockton; E. D. Hill, Plymouth; C. S. Millet, Rockland.

SUFFOLK.—Drs. A. N. Blodgett, E. G. Cutler, T. M. Rotch, F. C. Shattuck, F. H. Williams, Boston.

WORCESTER.—Drs. W. P. Bowers, Clinton; O. H. Everett, C. A. Peabody, J. B. Rich, Worcester; J. Wilmarth, Upton.

Worcester North.—Drs. E. J. Cutter, Leominster; J. R. Greenleaf, Gardner; A. P. Mason, E. P. Miller, F. H. Thompson, Fitchburg.

Commissioners of Trials.

Barnstable . . .	S. T. Davis . . .	Orleans.
Berkshire	A. M. Smith . . .	Pittsfield.
Bristol North . .	S. D. Presbrey . .	Taunton.
Bristol South . .	G. L. Ellis . . .	Middleboro'.
Essex North . . .	F. A. Howe . . .	Newburyport.
Essex South . . .	E. Newhall . . .	Lynn.
Franklin	C. Bowker . . .	Bernardston.
Hampden	L. J. Gibbs . . .	Chicopee Falls.
Hampshire . . .	W. Dwight . . .	North Amherst.
Middlesex East . .	F. F. Brown . . .	Reading.
Middlesex North .	W. M. Hoar . . .	Lowell.
Middlesex South .	E. J. Forster . . .	Charlestown.
Norfolk	S. E. Stone . . .	Walpole.
Norfolk South. . .	C. E. Prior . . .	Holbrook.
Plymouth	A. Millet	E. Bridgewater.
Suffolk	C. W. Swan . . .	Boston.
Worcester . . .	L. H. Hammond .	Worcester.
Worcester North .	A. L. Stickney . .	Ashburnham.

Officers of the District Medical Societies.

Barnstable.—Dr. J. E. Pratt, Sandwich, *President*; Dr. S. T. Davis, Orleans, *Vice-President*; Dr. F. A. Rogers, Brewster, *Secretary*; Dr. C. M. Hulbert, South Dennis, *Treasurer and Librarian.*

Berkshire.—Dr. D. M. Wilcox, Lee, *President*; Dr. O. S. Roberts, Pittsfield, *Vice-President*; Dr. H. Colt, Jr., Pittsfield, *Secretary*; Dr. W. M. Mercer, Pittsfield, *Treasurer*; Dr. H. W. Dewey, Jr., Pittsfield, *Librarian.*

Bristol North.—Dr. N. Paige, Taunton, *President*; Dr. F. L. Burden, Attleboro', *Vice-President*; Dr. E. F. Galligan, Taunton, *Secretary*; Dr. P. W. Hewins, Taunton, *Treasurer*; Dr. A. A. Steadman, Taunton, *Librarian.*

BRISTOL SOUTH.—Dr. G. T. Hough, New Bedford, *President*; Dr. C. D. Prescott, New Bedford, *Vice-President*; Dr. W. H. Taylor, New Bedford, *Secretary, Treasurer and Librarian.*

ESSEX NORTH.—Dr. J. A. Douglass, Amesbury, *President*; Dr. E. P. Hurd, Newburyport, *Vice-President*; Dr. G. W. Snow, Newburyport, *Secretary and Treasurer.*

ESSEX SOUTH.—Dr. C. C. Pike, Peabody, *President*; Dr. A. M. Tupper, Rockport, *Vice-President*; Dr. H. K. Foster, Peabody, *Secretary*; Dr. W. Neilson, Salem, *Treasurer*; Dr. G. Z. Goodell, Salem, *Librarian.*

FRANKLIN.—Dr. G. R. Fessenden, Ashfield, *President*; Dr. W. M. Wright, Orange, *Vice-President*; Dr. A. C. Deane, Greenfield, *Secretary, Treasurer and Librarian.*

HAMPDEN.—Dr. A. F. Reed, Holyoke, *President*; Dr. T. F. Breck, Springfield, *Vice-President*; Dr. G. L. Woods, Springfield, *Secretary, Treasurer and Librarian.*

HAMPSHIRE.—Dr. D. W. Miner, Ware, *President*; Dr. D. B. N. Fish, Amherst, *Vice-President*; Dr. C. W. Cooper, Northampton, *Secretary*; Dr. J. Dunlap, Northampton, *Treasurer*; Dr. C. Seymour, Northampton, *Librarian.*

MIDDLESEX EAST.—Dr. W. F. Stevens, Stoneham, *President*; Dr. S. W. Kelley, Woburn, *Vice-President*; Dr. D. March, Jr., Winchester, *Secretary*; Dr. J. O. Dow, Reading, *Treasurer and Librarian.*

MIDDLESEX NORTH.—Dr. W. Bass, Lowell, *President*; Dr. W. H. Leighton, Lowell, *Vice-President*; Dr. G. C. Osgood, Lowell, *Secretary*; Dr. W. B. Jackson, Lowell, *Treasurer*; Dr. C. A. Viles, Lowell, *Librarian.*

MIDDLESEX SOUTH.—Dr. Z. B. Adams, Framingham, *President*; Dr. S. W. Driver, Cambridge, *Vice-President*; Dr. W. Ela, Cambridge, *Secretary*; Dr. J. W. Willis, Waltham, *Treasurer*; Dr. W. A. Winn, Arlington, *Librarian.*

NORFOLK.—Dr. A. R. Holmes, Canton, *President*; Dr. B. Cushing, Dorchester, *Vice-President*; Dr. S. A. Potter, Roxbury, *Secretary and Librarian*; Dr. E. G. Morse, Roxbury, *Treasurer.*

NORFOLK SOUTH.—Dr. F. F. Forsaith, Weymouth, *President;* Dr. T. H. Dearing, Braintree, *Vice-President;* Dr. J. F. Welch, Quincy, *Secretary and Treasurer*; Dr. F. C. Granger, Randolph, *Librarian.*

PLYMOUTH.—Dr. F. Collamore, North Pembroke, *President;* Dr. H. F. Borden, Brockton, *Vice-President;* Dr. J. E. Bacon, Brockton, *Secretary and Treasurer;* Dr. A. A. MacKeen, South Abington, *Librarian.*

SUFFOLK.—Dr. G. B. Shattuck, Boston, *President;* Dr. J. Homans, Boston, *Vice-President;* Dr. C. M. Green, Boston, *Secretary;* Dr. E. M. Buckingham, Boston, *Treasurer;* Dr. B. J. Jeffries, Boston, *Librarian.*

WORCESTER.—Dr. A. Wood, Worcester, *President;* Dr. G. C. Webber, Millbury, *Vice-President;* Dr. O. H. Everett, Worcester, *Secretary;* Dr. J. O. Marble, Worcester, *Treasurer*; Dr. L. Wheeler, Worcester, *Librarian.*

WORCESTER NORTH.—Dr. R. F. Andrews, Gardner, *President;* Dr. L. Pillsbury, Fitchburg, *Vice-President;* Dr. C. H. Rice, Fitchburg, *Secretary;* Dr. E. P. Miller, Fitchburg, *Treasurer;* Dr. F. H. Thompson, Fitchburg, *Librarian.*

Massachusetts Medical Society.

PROCEEDINGS OF THE COUNCILLORS.

October 7, 1885.

A Stated Meeting of the Councillors was held in the hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Wednesday, October 7, 1885, at 11 o'clock, A.M.

The President, Dr. C. D. Homans, in the chair.

The following Councillors were present:

Barnstable.
T. R. Clement,
S. Pitcher.

Bristol North.
G. Mackie.

Bristol South.
J. H. Mackie,
F. A. Sawyer,
J. B. Whitaker.

Essex North.
J. Crowell,
D. Dana,
R. C. Huse.

Essex South.
H. Colman,
W. W. Eaton,
J. S. Emerson,
I. F. Galloupe,
T. L. Perkins.

Hampshire.
F. Tuckerman.

Middlesex East.
S. W. Abbott,
F. W. Graves.

Middlesex North.
N. B. Edwards,
F. Nickerson,
M. G. Parker.

Middlesex South.
A. P. Clarke,
E. Cowles,
C. K. Cutter,
J. A. Dow,
H. M. Field,
R. L. Hodgdon,
A. Hosmer,
H. E. Marion,
L. R. Stone,
C. E. Vaughan,
H. P. Walcott,
A. C. Webber,
H. C. White.

Norfolk.
C. C. Hayes,
J. G. S. Hitchcock,
I. H. Hazelton,
G. E. Mecuen,
J. Seaverns,
E. T. Williams.

Norfolk South.
T. H. Dearing,
G. W. Fay.

Plymouth.
J. B. Brewster,
H. W. Dudley,
J. C. Gleason,
W. R. Howes.

Suffolk.
S. L. Abbot,
J. Ayer,
H. H. A. Beach,
J. G. Blake,
H. I. Bowditch,
A. T. Cabot,
D. W. Cheever,
F. W. Draper,
T. Dwight,
R. T. Edes,
R. H. Fitz,
F. B. Greenough,
W. H. H. Hastings,
R. M. Hodges,
C. D. Homans,
W. Ingalls,
B. J. Jeffries,
F. I. Knight,
S. W. Langmaid,
G. H. Lyman,
F. Minot,
C. B. Porter,
J. P. Reynolds,
W. L. Richardson,
G. C. Shattuck,
B. S. Shaw,
A. D. Sinclair,
C. W. Swan,
G. G. Tarbell,
O. F. Wadsworth,
W. G. Wheeler,
E. N. Whittier,
H. W. Williams.

Worcester.
G. Brown,
W. Davis,
E. B. Harvey,
G. M. Morse,
W. E. Rice,
E. Warner.

Worcester North.
B. H. Hartwell,
I. Russell.

Total, 86.

The record of the previous meeting was read and accepted.

On nomination by the President the following were appointed Delegates to other State Medical Societies:

Vermont.—Drs. S. W. Abbott, of Wakefield; E. P. Hurd, of Newburyport.

New York.—Drs. G. W. Gay, of Boston; L. R. Stone, of Newton.

New York State Medical Association.—Drs. G. C. Shattuck, H. W. Williams, of Boston.

The Committee on Membership and Resignations reported through Dr. Ayer. In accordance with their recommendation the following were allowed to retire:

David W. Miner, of Ware.
John Yale, of Ware.
Luther B. Morse, of Watertown.

Also the following, having forfeited their membership under By-Law VI., were dropped from the roll:

Charles P. Bancroft, of Concord, N. H.
Charles L. Clark, of New York, N. Y.
Alexander A. Forbes, of Galveston, Texas.
Edward Hitchcock, Jr., of Ithaca, N. Y.
Edmund Lynch, of Brooklyn, N. Y.
Charles D. Stickney, of Washington, D. C.
Charles W. Wooldridge, of Whitehall, Mich.

Voted,—That the town of Stoughton be transferred to the Plymouth District.

Dr. Minot offered the following amendment to By-Law XIX., which was adopted:

In line 20, page 15, insert the words "five in number, who shall also act as a Committee on Finances"; and omit the words in lines 21 and 22, "a Committee on Finances."

Adjourned at 11.45, A.M.

FRANCIS W. GOSS,
Recording Secretary.

FEBRUARY 3, 1886.

A STATED MEETING of the Councillors was held in the hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Wednesday, February 3, 1886, at 11 o'clock, A.M.

The President, Dr. C. D. HOMANS, in the chair.

The following Councillors were present:

Bristol North.
G. Mackie,
W. S. Robinson.

Bristol South.
J. Dwelly.

Essex North.
J. Crowell,
D. Dana,
R. C. Huse.

Essex South.
W. W. Eaton,
J. S. Emerson,
I. F. Galloupe,
A. H. Johnson,
C. A. Lovejoy.

Middlesex East.
J. S. Clark.

Middlesex North.
N. B. Edwards,
F. Nickerson,
G. E. Pinkham.
F. C. Plunkett.

Middlesex South.
A. P. Clarke,
E. R. Cutler,
H. M. Field,
A. Hosmer,
H. E. Marion,
G. C. Pierce,
E. H. Stevens,
L. R. Stone,
G. J. Townsend,
H. P. Walcott,
A. C. Webber,
J. W. Willis.

Norfolk.
C. C. Hayes,
J. G. S. Hitchcock,
I. H. Hazelton,
H. T. Mansfield,
O. F. Rogers,
J. Seaverns,
J. A. Winkler.

Norfolk South.
T. H. Dearing,
G. W. Fay,
C. C. Tower.

Plymouth.
H. W. Dudley,
J. C. Gleason,
B. F. Hastings.

Suffolk.
S. L. Abbot,
J. Ayer,
H. H. A. Beach,
A. T. Cabot,
D. W. Cheever,
F. W. Draper,
S. H. Durgin,
R. T. Edes,
R. H. Fitz,
C. F. Folsom,
C. D. Homans,
J. Homans,
W. Ingalls,
B. J. Jeffries,
F. I. Knight,
S. W. Langmaid,
M. B. Leonard,
G. H. Lyman,
F. Minot,
C. B. Porter,
J. P. Reynolds,
W. L. Richardson,
G. C. Shattuck,
B. S. Shaw,
A. M. Sumner,
G. G. Tarbell,
W. G. Wheeler,
H. W. Williams.

Worcester.
G. Brown,
G. E. Francis,
E. B. Harvey,
G. M. Morse,
E. Warner,
G. C. Webber,
J. O. West,
L. Wheeler.

Worcester North.
B. H. Hartwell,
G. Jewett,
J. P. Lynde,
I. Russell.

Total, 81.

The record of the last meeting was read and accepted.

On nomination by the President the following were appointed Delegates to other State Medical Societies:

Maine.—Drs. R. Amory, E. G. Cutler, of Boston.
New Hampshire.—Drs. J. A. Douglas, of Amesbury; O. Warren, of West Newbury.
Rhode Island.—Drs. W. Ingalls, of Boston; G. S. Eddy, of Fall River.
Connecticut.—Drs. F. H. Hooper, of New Bedford; G. S. Stebbins, of Springfield.
New Jersey.—Drs. F. H. Brown, of Boston; J. Seaverns, of Roxbury.

In accordance with notice given at the last meeting, Dr. Draper offered the following which was adopted:

Voted,—To amend the Rules and Orders of the Councillors, as follows:

Paragraph 4 of Section 5, by omitting the words "obtaining . . . at the annual meeting, and also pointing out some mode in which Fellows who do not attend the meeting may obtain them"; and after the word "dinner" inserting the words "and the distribution of", so that the section shall read:

5. The Recording Secretary shall issue, and send by mail to every Fellow, one month before each annual meeting, a circular, which shall contain—

A notification of the time and place of the annual meeting of the Fellows;—

A similar notification of the stated meetings of the Councillors for the whole year, and of the stated meetings of the Board of Censors for the Suffolk District;—

All necessary information concerning the payment of assessments, admission to the annual dinner, and the distribution of the Society's publications;—

The conditions of admission to the Society, and all necessary information concerning the steps to be taken by those desirous of it.

Section 7, by striking out the word "Resignations" in the third line and substituting the word "Finances"; by inserting the word "and" before the words "a Committee on Ethics and Discipline"; and by omitting all the words after "Discipline" in the fifth line; so that the section shall read:

7. At the annual meeting of the Councillors, the following Standing Committees shall be appointed: viz., a Committee on Publications, a Committee on Membership and Finances, a Committee of Arrangements for the Anniversary, and a Committee on Ethics and Discipline.

Section 8, by striking out the words "a Committee to examine the library and cabinet; also" in the third and fourth lines; and the words "all of" in the sixth line; so that the section shall read:

8. At the third stated meeting of the Councillors, there shall be chosen a Committee to examine the Treasurer's accounts, on the week preceding the annual meeting, and a Committee to examine the By-Laws of the District Societies, to see whether they conform to the Laws of the State and of the State Society; which Committees shall make their reports to the Councillors at their annual meeting.

On nomination by the President, the following Committees were appointed:

To Audit the Treasurer's Accounts.—Drs. I. H. Hazelton, A. L. Mason.

To Examine the By-Laws of District Societies.—Drs. S. D. Presbrey, J. C. White, F. W. Chapin.

The Committee on Membership reported through Dr. Ayer. In accordance with their recommendation the following were allowed to resign:

George E. Brewer, of Washington, D. C.
Dwight W. Hunter, of New York, N. Y.

Also the following were dropped from the roll for non-payment of dues:

James C. How, of Haverhill.
James E. Keating, of Natick.
Alonzo Towle, of Freedom, N. H.

Also the following, having forfeited their membership under By-Law VI. by removal from the State, were dropped from the roll:

William H. Brinley, of Minneapolis, Minn.
Justus C. French, of Portland, Oregon.
Charles P. Kemp, of Rugby, Tenn.
George B. Richmond, of Salinas, Cal.
Charles A. Tufts, of Dover, N. H.
Fred W. Whitney, of Shelburne, N. Y.

Adjourned at 11.20, A.M.

FRANCIS W. GOSS,
Recording Secretary.

ANNUAL MEETING.

THE ANNUAL MEETING of the Councillors was held in the hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Tuesday, June 8, 1886, at 7 o'clock, P.M.

The President, Dr. C. D. HOMANS, in the chair.

The following Councillors were present:

Barnstable.
B. D. Gifford,
C. M. Hulbert,
P. Pineo.

Berkshire.
F. P. Whittlesey.

Bristol North.
A. S. Deane,
G. Mackie,
J. Murphy,
W. S. Robinson.

Bristol South.
J. B. Whitaker.

Essex North.
C. N. Chamberlain,
G. Montgomery.

Essex South.
H. Colman.
J. S. Emerson,
J. Garland,
W. A. Gorton,
A. H. Johnson,
T. Kittredge,
T. L. Perkins,
G. A. Priest.

Franklin.
F. J. Canedy.

Hampden.
F. W. Chapin,
J. W. Hannum,
G. C. McClean.

Hampshire.
W. Dwight,
D. W. Miner.

Middlesex East.
J. M. Harlow.

Middlesex North.
W. Bass,
W. H. Lathrop,
M. G. Parker.

Middlesex South.
T. Crozier,
C. K. Cutter,
W. W. Dow,
J. L. Hildreth,
R. L. Hodgdon,
E. G. Hoitt,
H. Holmes,
A. F. Holt,
A. Hosmer,
G. C. Pierce,
E. H. Stevens,
G. J. Townsend,
A. C. Webber,
H. C. White,
M. Wyman.

Norfolk.
G. O. Allen,
C. A. Bemis,
G. W. Clement,
I. H. Hazelton,
J. G. S. Hitchcock,
H. T. Mansfield,
G. E. Mecuen,
O. F. Rogers,
G. K. Sabine,
G. D. Townshend,
C. F. Withington.

Norfolk South.
G. W. Fay,
J. A. Gordon,
C. C. Tower.

Plymouth.
H. W. Dudley,
J. C. Gleason.

Suffolk.
S. L. Abbot,
J. Ayer,
C. J. Blake,
H. I. Bowditch,
A. T. Cabot,
D. W. Cheever,
H. Derby,
O. W. Doe,
F. W. Draper,
T. Dwight,
R. H. Fitz,
C. F. Folsom,
M. F. Gavin,
J. O. Green,
F. B. Greenough,
W. H. H. Hastings,
R. M. Hodges,
C. D. Homans,
J. Homans,
W. Ingalls,
M. B. Leonard,
G. H. Lyman,
A. E. McDonald,
F. Minot,
C. B. Porter,
J. P. Reynolds,
W. L. Richardson,
G. C. Shattuck,
B. S. Shaw,
A. D. Sinclair,
C. W. Swan,
O. F. Wadsworth,
J. C. Warren,
T. Waterman,
J. C. White,
E. N. Whittier,
H. W. Williams.

Worcester.
A. G. Blodgett,
G. Brown,
W. Davis,
E. B. Harvey,
W. E. Rice,
E. Warner,
G. C. Webber,
L. Wheeler,
A. Wood.

Worcester North.
J. R. Greenleaf, Jr.

Total, 107.

The record of the previous meeting was read and accepted.

The Secretary read the names of new and of deceased Fellows.

The Treasurer, Dr. Draper, read his annual report.

The Auditing Committee reported that they found the

accounts properly vouched and correctly cast, and that the Society's invested funds corresponded with the schedule exhibited.

The Treasurer's report was then accepted.

The Committee on Finances reported through Dr. Minot and recommended that $1000.00 from the surplus income be distributed among the District Societies.

The recommendation of the Committee was adopted.

The Committee on Membership and Resignations reported through Dr. Ayer. In accordance with their recommendation it was voted that the following be allowed to resign:

Herbert C. Bullard, of North Attleboro'.
William B. Goldsmith, of Providence, R. I.
Silas W. Davis, of Winchester.

Also that the following be allowed to retire:

Nathan Allen, of Lowell.
W. Symington Brown, of Stoneham.
John Renton, of Boston.

The Committee on Publications reported through Dr. Shattuck, and the report was accepted.

The Committee on the By-Laws reported through Dr. Presbrey. The report was accepted.

The Committee on Medical Diplomas reported through Dr. Richardson, and recommended a revised list of Medical Colleges whose diplomas are recognized for admission to the Society.

Voted,—To accept the Committee's report, and to adopt the list as recommended.

The Librarian, Dr. Brigham, presented his annual report, which was accepted.

Dr. G. B. Shattuck, Chairman of the Legislative Committee on the State Board of Health, Lunacy and Charity, made a report, giving an account of their labors which re-

sulted in the re-establishment of a separate and independent State Board of Health.

Voted,—To accept the report of the Committee.

The Committee on Nominations, through Dr. Hodgdon, reported a list of candidates for the offices of the Society for the ensuing year, and the same were elected by ballot:

President . . .	Dr. THOMAS H. GAGE, of Worcester.
Vice President . .	Dr. JOHN M. HARLOW, of Woburn.
Treasurer . .	Dr. FRANK W. DRAPER, of Boston.
Corresponding Secretary	Dr. CHARLES W. SWAN, of Boston.
Recording Secretary .	Dr. FRANCIS W. GOSS, of Roxbury.
Librarian . .	Dr. EDWIN H. BRIGHAM, of Boston.

Dr. GEORGE J. TOWNSEND, of South Natick, was chosen Orator, and

Dr. WILLIAM L. RICHARDSON, of Boston, Anniversary Chairman, for the next Annual Meeting of the Society.

Voted,—That the next Annual Meeting of the Society be held in Boston, on the second Wednesday in June, 1887.

On nomination by the President, the following Standing Committees were appointed:

Of Arrangements.

C. H. Williams, J. B. Swift, W. W. Gannett,
F. H. Hooper, H. C. Ernst, O. K. Newell.

On Publications.

G. C. Shattuck, R. M. Hodges, B. E. Cotting.

On Membership and Finances.

F. Minot, B. S. Shaw, D. W. Cheever,
J. Stedman, E. G. Cutler.

To Procure Scientific Papers.

C. W. Swan, G. S. Stebbins, J. R. Chadwick,
R. H. Fitz, H. P. Walcott.

On Ethics and Discipline.

G. J. Townsend, G. E. Francis, A. H. Johnson,
C. Howe, F. C. Shattuck.

On Medical Diplomas.

W. L. Richardson, A. H. Cowdrey, E. J. Forster,

Voted,—That the thanks of the Councillors be presented to Dr. James Ayer, for the skill and assiduity which he has shown for many years as Chairman of the Committee on Membership and Resignations.

Dr. Swan, Chairman of the Committee to Procure Scientific Papers, moved and it was

Voted,—That the vote of the Councillors passed February 3, 1875, establishing the office of Reporter in each District Society, and defining his duties and those of the Committee on Scientific Papers in connection therewith, be rescinded, and the office of Reporter hereby abolished.

Adjourned at 8.20, P.M.

FRANCIS W. GOSS,
Recording Secretary.

Massachusetts Medical Society.

PROCEEDINGS OF THE SOCIETY.

ADJOURNED MEETING.

OCTOBER 7, 1885.

THE Society met, pursuant to adjournment, in the hall of the Medical Library Association, No. 19 Boylston Place, Boston, on Wednesday, October 7, 1885, at 12.30, P.M.

The President, Dr. C. D. HOMANS, in the chair.

The Secretary read the portion of the record of the last Annual Meeting pertaining to this adjourned meeting.

Voted,—To concur with the Councillors in the following amendments to the By-Laws:

In By-Law XIX., line 20, page 15, insert the words "five in number, who shall also act as a Committee on Finances," and omit the words in lines 21 and 22 "a Committee on Finances."

By-Law XX., lines 14 and 15, instead of the words "Thursday before the last Saturday of September and of February," read "third Thursday of September and of December."

By-Law XX., lines 31–33, omit the words "provided, however, that the whole amount paid to any one Board shall not exceed the sum of sixty dollars for any single year."

By-Law XXIX., line 29, omit the words "a Committee, who shall report the same to."

Adjourned at 1, P.M.

FRANCIS W. GOSS,
Recording Secretary.

ANNUAL MEETING.

First Day.

The Society met in Huntington Hall, Institute of Technology, Boston, on Tuesday, June 8, 1886, at 2 o'clock, P.M.

The President, Dr. C. D. Homans, in the chair.

The following papers were read:

1. Abuse of Medical Charity: A Remedy Applied in 3000 Cases of Out-door Patients: Results.—By Frederick F. Doggett, M.D., of Boston. This paper was discussed by Drs. Hastings, Cornell and Morong.

2. Does the Law recently enacted by the Legislature prevent the Spread of Scarlet Fever?—By John L. Hildreth, M.D., of Cambridge. Drs. S. W. Abbott and Durgin made remarks upon this paper.

3. The Present Status of Bacterial Pathology, and its Relation to Therapeutics.—By Albert N. Blodgett, M.D., of Boston. This paper was remarked upon by Dr. Ernst.

4. The Management of Cases of Rigidity of the Os Uteri in Labor.—By William E. Boardman, M.D., of Boston. Dr. C. M. Green made remarks on this paper.

5. A not well-recognized Source of Domestic Poisoning, with Cases.—By Charles Harrington, M.D., of Boston. Remarks were made upon this paper by Drs. Davenport and White.

6. Abdominal Cellulitis.—By Julian A. Mead, M.D., of Watertown.

Adjourned at 5.15, P.M.

FRANCIS W. GOSS,
Recording Secretary.

Second Day.

The Society met in Huntington Hall, Boston, on Wednesday, June 9, 1886, at 9 o'clock, A.M., for the exercises of the one hundred and fifth Anniversary.

The President, Dr. C. D. Homans, in the chair.

The records of the last annual meeting and of the adjourned meeting were read and accepted.

The Secretary read the names of Fellows admitted since the last annual meeting, and of Fellows whose deaths had been reported.

Fellows admitted since June 9, 1885.

1885	Baldwin, Henry Cutler	Somerville.
1885	Boyd, Samuel George	San Francisco, Cal.
1886	Brackett, Elliott Gray	Boston.
1885	Breck, Samuel	Boston.
1886	Brigham, Frank Fontelle	Lynn.
1886	Buckley, Philip Townsend	Boston.
1885	Burton, Stephen Caspar	Pittsfield.
1886	Carpenter, Helen Braddock	Boston.
1885	Chapin, Walter Henry	Springfield.
1886	Chase, Heman Lincoln	Boston.
1885	Clark, Arthur Wellington	Boston.
1886	Clark, Joseph Payson	Boston.
1886	Cochrane, John McGregor	Boston.
1885	Coffin, Arthur Baylies	Roxbury.
1885	Coughlin, John William	Fall River.
1885	Crowell, Samuel	Quincy.
1886	Davis, Myron John	Springfield.
1886	DeLand, Charles Airmet	Boston.
1885	Delano, Samuel	Warren.
1886	Dobson, William Gaius	Lynn.
1885	Dolan, William Andrew	Fall River.
1886	Duggan, John Thomas	Worcester.
1885	Durant, Charles Edwin	Haverhill.
1885	Eldridge, David Gorham, Jr.	Jamaica Plain.
1885	Faxon, William Lyman	Quincy.
1885	Flynn, James Aloysius	Pittsfield.
1885	Foster, Burnside	Boston.
1885	Gates, George Wellesley	Brookline.
1885	Getchell, Albert Calley	Worcester.
1885	Getz, Charles	Baltimore, Md.
1886	Gibbs, Linnæus Victor	Worthington.
1885	Graves, Charles Burr	Boston.
1886	Guptill, Ira Clark	Northboro'.
1885	Hahn, Albert John	
1885	Hall, William Dudley	Boston.

1886	Hill, Ira Clark	Haydenville.
1886	Howe, James Sullivan . . .	Boston.
1885	Howe, Oliver Hunt . . .	Boston.
1885	Jackson, Fred William . .	Weston.
1885	Jones, Charles Dana . . .	Haverhill.
1886	Keefe, Daniel Edward . .	Springfield.
1886	Klinghammer, William Jerome .	Roxbury.
1886	Linfield, Edwin Porter . .	East Stoughton.
1885	Livermore, George Edward .	Tewksbury.
1885	Lovell, Charles Edward . .	Tewksbury.
1886	Lowe, Fred Messenger . .	North Cambridge.
1886	McCarthy, Charles Daniel . .	Malden.
1886	McGannon, Matthew Charles .	Lowell.
1886	McGowan, John Denis . .	Boston.
1886	McIntire, David	Charlestown.
1885	McLaughlin, Joseph Ignatius .	Roxbury.
1885	Morgan, John	Springfield.
1885	Morse, Frederick Harris . .	Melrose.
1886	Nichols, Hannah Leah . .	Sherborn.
1886	Norton, Eben Carver . . .	Tewksbury.
1886	Patton, Ella Martha . . .	Tewksbury.
1886	Pengra, Charles Philip . .	Boston.
1886	Perkins, George William . .	Boston.
1886	Perkins, John Walter . . .	Boston.
1885	Perry, Arthur Pedro . . .	Jamaica Plain.
1886	Pomeroy, Hiram Sterling . .	Boston.
1886	Qua, Lester Robert . . .	Lowell.
1885	Scofield, Walter W . . .	Dalton.
1885	Smith, Hiram Fred Markley .	Orange.
1886	Starbird, Isaac Warren . .	Dorchester.
1886	Stevens, Seriah	Marshfield.
1885	Stone, Charles Sinclair . .	Roxbury.
1886	Stuart, Frederic William . .	Boston.
1885	Taft, Charles Ezra . . .	Boston.
1886	Tenney, John Arthur . . .	Boston.
1886	Tolman, Julia	Arlington.
1885	Trowbridge, Edward Henry .	Worcester.
1885	Twitchell, Edward Thayer . .	Boston.
1886	Twombly, Edward Lambert .	Boston.
1886	Washburn, George Hamlin . .	Boston.
1886	Wellington, Charles Berwick .	Cambridgeport.
1885	Wentworth, Jacob Brackett .	Lowell.
1886	Woodbury, Frederic Clinton .	Boston.

Total, 78.

List of Deceased Fellows.

Admitted.	Name.	Residence.	Date of Death.	Age.
1882	AIKEN, WILLIAM HENRY.........	Malden........	Sept. 17, 1885	36
1844	BATES, GEORGE ANSON...........	Worcester......	Aug. 9, 1885	65
1836	BETHUNE, GEORGE AMORY,........	Boston	April 5, 1886	73
1875	BROWNELL, NATHAN PIKE........	South Scituate..	Dec. 30, 1885	60
1865	DRAPER, JOSEPH RUTTER.........	South Boston..	Aug. 5, 1885	55
1857	DREW, DAVID FOGG..............	Lynn..........	Feb. 13, 1886	66
1883	DYER, ANDERSON DANA..........	Brandon, Vt....	April 12, 1886	27
1876	*FLINT, AUSTIN.................	New York, N.Y.	Mar. 13, 1886	73
1840	FOSTER, JAMES WOLCOTT.........	North Attleboro'	Sept. 17, 1885	72
1847	GOODENOUGH, LEVI..............	South Sudbury.	April 3, 1886	82
1827	GREEN, JOHN ORNE..............	Lowell.........	Dec. 23, 1885	86
1858	HAYWARD, JOHN MCLEAN........	Wayland.......	Mar. 9, 1886	48
1882	LOMBARD, FREDERIC HOWARD.....	Boston	Dec. 15, 1885	33
1848	MATTSON, MORRIS...............	New York, N. Y.	June 14, 1885	76
1843	MORSE, HORATIO GILEAD.........	Roxbury.......	May 12, 1886	69
1871	OTIS, ROBERT MENDUM..........	Roslindale	Mar. 19, 1886	42
1839	PARKER, DAVID..................	Gardner	May 8, 1886	84
1859	PIERCE, GEORGE WASHINGTON....	Leominster.....	May 1, 1886	66
1845	RICHARDSON, EBENEZER COOLIDGE.	Ware..........	Jan. 10, 1886	65
1882	RICKER, CLINTON JOSEPH.........	Chatham.......	Mar. 15, 1886	39
1866	SHEPARD, WILLIAM HENRY HASTON	Westminster...	Feb. 7, 1886	44
1868	SMITH, JOSEPH HAVEN...........	Lowell........	Feb. 25, 1886	80
1883	SULLIVAN, JAMES JOSEPH.........	Lowell.........	Aug. 11, 1885	28
1839	THOMPSON, JOHN LELAND SHERMAN	Lancaster......	Dec. 25, 1885	74
1845	VAILLE, HENRY ROBERT.........	Springfield.....	July 15, 1885	76
1871	WARNER, GEORGE OTIS...........	Leicester.......	Nov. 12, 1885	46
1877	WHITTEMORE, JAMES HENRY......	Boston	Jan. 6, 1886	46
1853	WILCOX, CHAUNCY ADAMS........	Uxbridge	Aug. 27, 1885	59
1834	WOOD, ALFRED..................	Taunton......	Dec. 28, 1885	89
1855	WOODWARD, RUFUS...............	Worcester......	Dec. 30, 1885	66
1831	WORKMAN, WILLIAM.............	Worcester......	Oct. 17, 1885	87
			Total, 31.	

* Honorary.

The Treasurer, Dr. Draper, read his annual report.

Papers were read as follows:

7. AN EPIDEMIC OF MALARIA IN EASTERN MASSACHUSETTS IN 1885.—By Zabdiel B. Adams, M.D., of Framingham. This paper was remarked upon by Dr. G. C. Pierce.

8. THE CAUSATION AND TREATMENT OF LATERAL CURVATURE.—By Edward H. Bradford, M.D., of Boston. Dr. Kinnear made remarks upon this paper.

9. SOME OF THE RESULTS OF FRACTURES.—By Joseph E. Garland, M.D., of Gloucester.

10. THE ETIOLOGY AND TREATMENT OF SUMMER DIARRHŒA OF INFANTS.—By Henry C. Haven, M.D., of Boston.

Dr. Ernest W. Cushing, of Boston, exhibited a case of fractured patella which he wired, opening the joint antiseptically, on the day after the accident. Perfect union resulted without fever or suppuration.

The following Delegates from other State Medical Societies were introduced:

Maine.—Dr. F. L. Gerrish.

New Hampshire.—Drs. J. H. Cutler, L. W. Peabody, C. A. Sanborn.

Rhode Island.—Dr. W. F. Morrison.

New Jersey.—Dr. R. Wescott.

At 12 o'clock the Annual Discourse was delivered by Dr. R. M. HODGES, of Boston.

At the close of the oration a vote of thanks was presented to the orator for his excellent, comprehensive and very suggestive address.

The President introduced the President-elect, Dr. THOMAS H. GAGE, of Worcester, who made a fitting response.

At 1, P.M., the Society adjourned to the Winslow Skating Rink, where the eighty-fifth Annual dinner, presided over by the Anniversary Chairman, Dr. EDWIN B. HARVEY, was served to seven hundred and fifty-five Fellows and invited guests.

FRANCIS W. GOSS,
Recording Secretary.

TREASURER'S REPORT.

THE Treasurer begs leave respectfully to present the following report of the Society's finances for the year ending April 15, 1886:

Balance from the previous year . .	$1710 73
Receipts from various sources during the year	8741 67
	10452 40
Expenses during the year . . .	8685 03
Balance on hand	$1767 37

Appended is an analysis-account of the various receipts and expenses above summarized.

The invested funds of the Society remain as reported in previous years, as follows:

General Fund	$11253 30
Shattuck Fund	9166 87
Phillips Fund	10000 00
Cotting Fund	2000 00
Total	$32420·17

These funds yield interest at the rate of four per cent.

Thirteen members of the Society have forfeited their membership during the past year by removal from Massachusetts and failure to pay their assessments. The names of three Fellows have been dropped from the rolls, since the last annual meeting, by vote of the Councillors, in consequence of five years' delinquency in the payment of dues.

The Society now bears on its membership-list the names of 1605 Fellows.

F. W. DRAPER,
Treasurer.

BOSTON, June 3, 1886.

The Committee appointed at the February meeting to audit the Treasurer's accounts have carefully attended to their duty, and would respectfully report that they find them properly vouched and correctly cast. They have also examined the Society's invested funds and find them to correspond with the schedule, amounting to $32,420.17.

ISAAC H. HAZELTON, } *Auditing*
A. L. MASON, } *Committee.*

BOSTON, May 27, 1886.

DR. **F. W. Draper, Treasurer, in account with**

INCOME.

Balance from last account		$1710 73
Assessments paid to the Treasurer		1335 00
Assessments collected by District Treasurers:—		
Barnstable	$100 00	
Berkshire	200 00	
Bristol North	155 00	
Bristol South	210 00	
Essex North	305 00	
Essex South	385 00	
Franklin	120 00	
Hampden	260 00	
Hampshire	170 00	
Middlesex East	105 00	
Middlesex North	385 00	
Middlesex South	385 00	
Norfolk	610 00	
Norfolk South	135 00	
Plymouth	125 00	
Suffolk	1705 00	
Worcester	510 00	
Worcester North	170 00	
		6035 00
Interest account:—		
General Fund	450 12	
Shattuck Fund	366 67	
Phillips Fund	400 00	
Cotting Fund	65 00	
Interest on cash-balance in Savings banks	64 88	
		1346 67
Diplomas		25 00
		$10452 40

the Massachusetts Medical Society. **Cr.**

Expense.

On account of Annual Meeting, 1885:—		
Carpenter's bill for building and removing platform in Dining Hall	$89 25	
Caterer's bill	1521 00	
Cigars	86 90	
Incidentals	59 15	
Music	105 00	
Printing	16 00	
Rent of Dining Hall	125 00	
		$2002 30
Committee on Ethics and Discipline, for mileage		39 40
Committee (special) on Public Health legislation, for printing		46 41
Committee on Publications:—		
Braithwaite's Retrospect	2335 00	
Printing Annual Publications, 1885	558 28	
Wood-cuts	10 50	
		2903 78
Councillors' Orders:—		
Lunches at Stated Meetings (paid by income of Cotting Fund)	50 00	
Expenses of Special Committee on Medical Legislation	216 06	
Binding Society's pamphlets	24 90	
		290 96
District Societies' account:—		
Censors' fees	255 00	
Dividend, 1885	1368 58	
Printing and stationery for Censors-at-large	6 95	
Advertising meetings of Censors-at-large	18 00	
District Treasurers' fees and expenses	346 73	
		1995 26
Librarian's Expenses:—		
Allowance for Clerk	50 00	
Postage and Express	318 30	
Printing	8 75	
		377 05
Recording Secretary's Expenses:—		
Incidentals, postage, &c.	11 75	
Printing	129 43	
Salary	250 00	
Stationery	1 75	
		392 93
Rent to January 1, 1886		150 00
Treasurer's Expenses:—		
Postage and printing	74 24	
Salary	400 00	
Stationery	12 70	
		486 94
		8685 03
Balance to new account		1767 37
		$10452 40

Officers of the Massachusetts Medical Society.

1886—1887.

Chosen June 8, 1886.

THOMAS H. GAGE, . .	Worcester, .	President.
JOHN M. HARLOW . .	Woburn, .	. Vice-President.
FRANK W. DRAPER, .	Boston, .	. Treasurer.
CHARLES W. SWAN, .	Boston, .	. Cor. Secretary.
FRANCIS W. GOSS, . .	Roxbury,	. Rec. Secretary.
EDWIN H. BRIGHAM, .	Boston, .	. Librarian.
GEORGE J. TOWNSEND,	So. Natick,	. Orator.
WM. L. RICHARDSON, .	Boston, .	. Anniv. Chairman.

Standing Committees.

Of Arrangements.

C. H. Williams, H. C. Ernst,
F. H. Hooper, W. W. Gannett,
J. B. Swift, O. K. Newell.

On Publications.

G. C. Shattuck, R. M. Hodges, B. E. Cotting.

On Membership and Finances.

F. Minot, B. S. Shaw, D. W. Cheever,
J. Stedman, E. G. Cutler.

To Procure Scientific Papers.

C. W. Swan, G. S. Stebbins, J. R. Chadwick,
R. H. Fitz, H. P. Walcott.

On Ethics and Discipline.

G. J. Townsend, G. E. Francis, A. H. Johnson,
C. Howe, F. C. Shattuck.

On Medical Diplomas.

W. L. Richardson, A. H. Cowdrey, E. J. Forster.

Presidents of District Societies—Vice-Presidents (Ex-Officiis).

(Arranged according to Seniority.)

L. Pillsbury,	E. P. Hurd,
L. F. Humeston,	W. P. Bolles,
F. F. Forsaith,	G. C. Webber,
N. Paige,	O. J. Brown,
S. W. Driver,	G. B. Shuttuck,
D. B. N. Fish,	W. F. Stevens,
W. H. Leighton,	T. R. Clement,
G. T. Hough,	A. M. Tupper,
H. F. Borden,	G. R. Fessenden.

Councillors.

Barnstable.—Drs. B. D. Gifford, Chatham; C. M. Hulbert, South Dennis; P. Pineo, Hyannis.

Berkshire.—Drs. C. W. Burton, Adams; C. E. Heath, Lee; W. W. Leavitt, Pittsfield; J. H. A. Matte, H. J. Millard, North Adams; F. P. Whittlesey, Great Barrington.

Bristol North.—Drs. A. S. Deane, Taunton; G. Mackie, Attleboro'; J. Murphy, W. S. Robinson, Taunton; J. E. Totten, Attleboro'.

Bristol South.—Drs. J. Dwelly, Fall River; S. W. Hayes, J. H. Mackie, C. D. Prescott, J. J. B. Vermyne, New Bedford; J. B. Whitaker, Fall River.

Essex North.—Drs. F. H. Allen, Haverhill; C. N. Chamberlain, H. M. Chase, Lawrence; H. J. Cushing, Merrimac; F. A. Howe, Newburyport; O. H. Johnson, Haverhill; G. Montgomery, Newburyport; R. B. Root, Georgetown; L. A. Woodbury, Groveland.

Essex South.—Drs. C. Burnham, H. Colman, J. S. Emerson, Lynn; P. Eveleth, Marblehead; J. Garland, Gloucester; W. A. Gorton, Danvers; A. H. Johnson, T. Kittredge, T. L. Perkins, Salem; G. A. Priest, Manchester; S. W. Torrey, Beverly.

Franklin.—Drs. F. J. Canedy, Shelburne Falls; A. C. Deane, Greenfield; O. A. Wheeler, Bernardston.

Hampden.—Drs. S. W. Bowles, T. F. Breck, L. S. Brooks, F. W. Chapin, Springfield; G. E. Fuller, Monson; J. W. Hannum, Ludlow; G. C. McClean, G. S. Stebbins, Springfield.

HAMPSHIRE.—Drs. W. Dwight, North Amherst; D. W. Miner, Ware; E. B. Nims, Northampton; S. R. Towne, Enfield.

MIDDLESEX EAST.—Drs. F. F. Brown, Reading; J. S. Clark, Melrose; J. M. Harlow, *Vice President*, Woburn; C. Jordan, Wakefield.

MIDDLESEX NORTH.—Drs. W. Bass, Lowell; C. Dutton, Tyngsboro'; C. M. Fisk, Lowell; S. W. Fletcher, Pepperell; W. H. Lathrop, A. W. Lavigne, F. Nickerson, M. G. Parker, G. H. Pillsbury, F. C. Plunkett, H. J. Smith, Lowell.

MIDDLESEX SOUTH.—Drs. Z. B. Adams, Framingham; T. Crozier, Charlestown; E. R. Cutler, Waltham; C. K. Cutter, Charlestown; W. W. Dow, Somerville; H. M. Field, Newton; J. L. Hildreth, Cambridge; R. L. Hodgdon, Arlington; E. G. Hoitt, Marlboro'; H. Holmes, Lexington; A. F. Holt, Cambridgeport; A. Hosmer, Watertown; O. E. Hunt, Newtonville; G. C. Pierce, Ashland; E. H. Stevens, North Cambridge; J. L. Sullivan, Malden; J. B. Taylor, East Cambridge; G. J. Townsend, South Natick; A. C. Webber, W. W. Wellington, Cambridgeport; H. C. White, East Somerville; M. Wyman, Cambridge.

NORFOLK.—Drs. G. O. Allen, West Roxbury; C. A. Bemis, West Medway; J. W. Chase, Dedham; G. W. Clement, E. L. Farr, Roxbury; I. H. Hazleton, Wellesley Hills; J. G. S. Hitchcock, Foxboro'; H. T. Mansfield, Needham; G. E. Mecuen, Roxbury; J. H. Richardson, Medfield; O. F. Rogers, Dorchester; G. K. Sabine, Brookline; G. D. Townshend, E. T. Williams, C. F. Withington, Roxbury.

NORFOLK SOUTH.—Drs. G. W. Fay, East Weymouth; J. A. Gordon, Quincy; C. C. Tower, South Weymouth.

PLYMOUTH.—Drs. J. B. Brewster, Plymouth; H. W. Dudley, Abington; J. C. Gleason, Rockland; B. F. Hastings, Whitman; A. E. Paine, Brockton.

SUFFOLK.—Drs. S. L. Abbot, J. Ayer, H. J. Bigelow, C. J. Blake, J. G. Blake, H. I. Bowditch, E. H. Bradford, A. T. Cabot, D. W. Cheever, H. Curtis, H. Derby, O. W. Doe, F. W. Draper, *Treasurer*, S. H. Durgin, T. Dwight, R. T. Edes, R. H. Fitz, C. F. Folsom, Boston; M. F. Gavin, South Boston; G. W. Gay, J. O. Green, F. B. Greenough, W. H. H. Hastings, R. M.

Hodges, C. D. Homans, J. Homans, W. Ingalls, B. J. Jeffries, F. I. Knight, S. W. Langmaid, Boston; M. B. Leonard, East Boston; G. H. Lyman, A. E. McDonald, F. Minot, C. B. Porter, J. P. Reynolds, W. L. Richardson, G. C. Shattuck, B. S. Shaw, A. D. Sinclair, A. M. Sumner, C. W. Swan, *Corresponding Secretary*, G. G. Tarbell, O. F. Wadsworth, J. C. Warren, T. Waterman, Boston; W. G. Wheeler, Chelsea; J. C. White, E. N. Whittier, H. W. Williams, Boston.

WORCESTER.—Drs. A. G. Blodgett, West Brookfield; G. Brown, Barre; W. Davis, G. E. Francis, T. H. Gage, *President*, Worcester; E. B. Harvey, Westboro'; G. M. Morse, Clinton; J. G. Park, J. M. Rice, Worcester; W. E. Rice, North Grafton; E. Warner, Worcester; G. C. Webber, Millbury; J. O. West, Princeton; L. Wheeler, A. Wood, Worcester.

WORCESTER NORTH.—Drs. J. M. Blood, Ashby; G. D. Colony, Fitchburg; J. R. Greenleaf, Jr., Gardner; B. H. Hartwell, Ayer; F. H. Thompson, Fitchburg.

Censors.

BARNSTABLE.—Drs. G. W. Doane, Hyannis; R. H. Faunce, Sandwich; H. S. Kelley, Jr., Dennisport; G. N. Munsell, Harwich; W. N. Stone, Wellfleet.

BERKSHIRE.—Drs. E. E. Mather, Williamstown; F. K. Paddock, Pittsfield; G. H. Race, West Stockbridge; A. M. Smith, Williamstown; D. M. Wilcox, Lee.

BRISTOL NORTH.—Drs. C. A. Atwood, Taunton; J. B. Gerould, North Attleboro'; M. C. Golden, J. B. Murphy, M. Perry, Taunton.

BRISTOL SOUTH.—Drs. A. J. Abbé, G. S. Eddy, Fall River; G. DeN. Hough, W. N. Swift, W. H. Taylor, New Bedford.

ESSEX NORTH.—Drs. J. Crowell, Haverhill; F. B. Flanders, Lawrence; R. C. Huse, Georgetown; A. F. Shea, Lawrence; J. F. Young, Newburyport.

ESSEX SOUTH.—Drs. F. A. Durgin, Salem; J. Kittredge, Marblehead; C. C. Sheldon, Lynn; G. B. Stevens, Gloucester; C. G. Weston, Peabody.

FRANKLIN.—Drs. A. V. Bowker, Miller's Falls; F. J. Canedy, Shelburne Falls; E. A. Deane, Montague; J. H. Goddard, Orange; C. G. Trow, South Deerfield.

HAMPDEN.—Drs. J. S. Bagg, C. D. Brewer, Springfield; F. F. Dole, Chicopee; C. P. Hooker, Springfield; J. C. Hubbard, Holyoke.

HAMPSHIRE.—Drs. C. W. Cooper, Northampton; J. M. Fay, Haydenville; C. L. Knowlton, Northampton; H. H. Seelye, Amherst; C. S. Wheeler, Williamsburg.

MIDDLESEX EAST.—Drs. J. P. Bixby, North Woburn; G. W. Nickerson, Stoneham; C. C. Odlin, Melrose; P. Sheldon, Wakefield; F. Winsor, Winchester.

MIDDLESEX NORTH.—Drs. F. W. Chadbourne, Lowell; J. B. Heald, Westford; H. P. Jefferson, J. J. McCarty, C. P. Spalding, Lowell.

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